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CALIFORNIA RURAL LAND USE  
AND  
MANAGEMENT

A History of the Use and Occupancy  
of Rural Lands in California

By

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and

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United States Department of Agriculture  
Forest Service  
California Region



Chapter XII Progress and Development - 1921-1932

Chapter XIII Low Tide in Rural Prosperity - Dawning Hopes  
1933-1941

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## XII. PROGRESS AND DEVELOPMENT - 1921-1932.

The California farmer of the 1920's was an altogether different type of individual from that of his forebears of half a century previously. The bewhiskered, straw-chewing type of agriculturist so popular with comic strip artists was not at all a conspicuous figure in the California rural picture. The chances were about equal that the young, independent farmer, whether livestock producer, dairyman, viticulturist or orchardist, met up with in the rural regions, was a college graduate and in any case most certain to be well read and somewhat of a scientist in his particular branch of agriculture.

Liberal gifts of Federal lands to the State had played a large part in building up a school system which placed educational facilities within the reach of all. Rural residents shared in the educational advantages made possible by endowments with which many of the great California educational institutions were supported, and these in many cases came from private funds obtained from the use of California lands, agriculture, mining, and sometimes the sale of the lands themselves.

In 1925, the University of California had the largest student enrollment of any college in the United States with 37,480 students on its roster. The enrollment in agricultural extension courses that year numbered 6,436, besides 530 students in actual residence at the University college farm at Davis. The University Farm was the outgrowth of the college of mining and mechanical arts, founded away back in 1866. The university farm itself was established in 1905 with a State appropriation of \$150,000, and the following 780 acres of land was purchased for \$103,000, the balance of the allotment being used for construction of buildings and purchase of equipment. An additional \$132,000 was allocated to the agricultural institution in 1907. The State school for farmers got under actual way with its curriculum in 1908, and a formal three-year agricultural course for boys who had finished common school was inaugurated in 1909. In the development of the science of agriculture this official State institution has played a major part through the years since.

The great Stanford University at Palo Alto, listed as one of the leading educational institutions of the United States, the San Luis Obispo Polytechnic Institute, five outstanding State normal schools and a large number of denominational and private colleges also contributed towards making higher education easily available to urban and rural youth alike. In 1932, college buildings alone in the State of California were valued at thirty-six million dollars.



Federal lands granted to the State for educational and other purposes up to 1930 were as follows:

For Internal Improvements	-----	500,000	acres
For University Benefit	-----	46,080	"
For Public Buildings	-----	6,400	"
For Agricultural and Mechanical colleges	-----	150,000	"
Common Schools (Sections 16 and 36 in each Township)	-----	5,534,293	"
Declared Swamp and Overflow lands	-----	2,189,607	"
Total		8,426,380	"

The General Land Office figures show that up to June 30, 1931 a total area of 8,620,739 acres had been patented by the Federal Government to the State of California. This aggregate gift of land, however, liberal tho it was, represented some three million acres less than that given outright to the Southern Pacific Railway.

#### Mis-used Public Lands

Of the above State lands, five million acres had passed into private ownership, the State yet pushing the sale of its lands as much as possible. The area remaining in State ownership was mainly wild land, uncultivable, and altho exchanges were being made with the Federal government to consolidate State holdings as much as possible, generally such lands were intermingled and generally used indiscriminately with adjacent government lands.

That it was still an easy matter for private owners to secure a piece of the public domain is evidenced by the fact that in 1930 the area of unappropriated, unreserved public domain in California was given as 21,748,560 acres but a year later this area had shrunk to 16,046,948 acres. Altho part of this reduction was due to various Federal withdrawals, land filings, nibbling here and there at the public domain, were responsible for a good part of the shrinkage in area.

In the year 1921, records indicate that a total of 746,832 acres of public and Indian lands were filed on under such laws as the enlarged homestead and grazing homestead acts. That same year the General Land Office reported that they had formally surveyed to date 81,300,276 acres and that 18,317,004 acres in the State remained unsurveyed. That the General Land Office still had its hands more than full with land transactions is indicated by the fact that that same year this government bureau handled in the



entire United States 22,223 fraudulent land cases, -- initiated, investigated, dismissed, convictions secured, or otherwise acted upon.

Altho California was used to land frauds, she shared the shame of her sister state when her lands became part of the setting for the Teapot Dome scandal, involving manipulation of oil land leases on public lands in Wyoming and California. President Taft in 1912 had created Naval Oil Reserves No. 1 and 2 in California, containing 38,969 and 29,341 acres, respectively. By an executive order dated May 31, 1921, administration of these oil reserves was transferred from the Navy Department to the Department of the Interior.

Somewhat later, the nation was shocked when a Senate investigating committee uncovered corrupt practices on the part of Secretary of the Interior, Albert E. Fall. Briefly, this involved the leasing of the Teapot Dome oil field to Harry F. Sinclair, president of the Mammoth Oil Company and the Elk Hills Oil field to Edward L. Doheny, president of the Pan-American Oil Company. The cabinet officer and his oil magnate associates had reaped a rich harvest thru the exploitation of these public oil lands. After the case against them had dragged thru the highest courts for years, Sinclair, Doheny and his son and the now Ex-Secretary Fall were all convicted. Fall was sentenced to one year in jail and fined \$100,000. The oil men, perhaps somewhat expected to do a little palm greasing in their business interests, suffered even a lighter punishment. This was the only case in United States history of a cabinet officer suffering the ignominy of a jail sentence for the betrayal of a public trust. It was somewhat of an analogy, perhaps, that Fall was an avowed enemy of the conservation movement.

All in all, a good job was being done in legislation to protect publicly-owned oil lands in California. Up to June 30, 1923 oil land withdrawals in the State totalled 1,178,392 acres, the greatest acreage of any of the eight states in the West and South containing potential oil deposits. Private enterprise was in no way stifled by these withdrawals since generous prospecting permits could be obtained from the government as well as leases for petroleum production at a price commensurate with the resultant yield. Other laws covering the acquisition of lands also reserved in public ownership oil which might later be discovered beneath such lands and in following years unpleasant situations sometimes arose when a landowner, having secured Federal title to a tract of land, was forced by law to yield the right of way to oil prospectors operating on his premises.





From the date of the passage of the original Desert Land Act on March 3, 1877 to June 30, 1923, entries of land under this law covered a total of 5,119,206 acres in California. Many entrymen, however, never followed up their original intentions, since the total of final entries for the period was 859,269 acres, with a resultant revenue to the government of \$2,177,261. The total area of swamp and overflow land patented to the State of California up to June 30, 1922, was 2,159,304 acres.

A rather detailed inventory of the remaining public domain was taken in 1931 by the General Land Office, assisted by the Forest Service. Located in 37 of the 58 counties of California, as can well be imagined, this free-for-all land was by now in a pretty sorry state. G. Cecil Alter, writing in the National Wool Grower almost a decade previously had said, "Probably no grazing region in the world needs the rehabilitating influence of a sound and far-sighted range management policy so much as the 'blistered foothills' of California."

Approximately one-half of this unreserved public land was desert, pure and simple, located in the extreme southern section of the State. The best of it was sagebrush and sparse woodland lying east of the Sierra Nevada range, the larger bodies of which were badly broken up patented homesteads and State-owned lands. That year it was estimated that only 808,000 acres of the total offered limited possibilities for management as a forest resource, and of this 513,000 acres was suitable only for the production of fuel, fence posts and minor forest products. The remaining 295,000 acres could, under protective management, be made to produce low grade sawtimber.

Approximately one-half of this public domain was used for grazing and furnished forage for brief periods of the year for an estimated 86,300 head of cattle and 577,000 head of sheep, mainly in connection with protected range lying at higher elevations in the national forests. At least half of the public domain area had considerable value as watershed protection and as a shelter for wild life such as deer, antelope, mountain sheep and upland game birds. The best of it was used for interstate grazing in connection with the Nevada livestock ranges. Nearly all of this public land area was deeply gullied from soil erosion and supported worthless, unpalatable weeds which had replaced the natural forage as a result of fire and other abuses.

Mention was made in a previous chapter of the last addition of public domain of 350,000 acres to the national forests of California in late 1920. The area at that time was in bad shape with owners of some 125,000 sheep and a considerable number of cattle battling for what feed could be secured on the area. Forest Service administrators removed the nomad and alien grazers, established seasons and stock limits and by 1925 under systematic protection and management, the area had staged a remarkable comeback.





These wild lands were now a valuable supplement to the livestock industry in large neighboring valleys, were filling timber needs for minor forest products and providing grazing for many thousands of deer and the largest herd of prong-horned antelope in the State.

The history of the rehabilitation of this area and similar examples on much smaller areas, probably was responsible for the proposal made in several quarters towards the end of the third decade of the 20th century that all the remaining public domain, reserved and unreserved, be turned over to the Forest Service for administration and protection, since much of it lay contiguous to the national forests. Petitions for such action were presented to Congress by various Western interests but some years were yet to elapse before these public lands would be placed under any form of protection and management.

Large fires frequently occurred on these lands, sometimes reaching 50,000 to 100,000 acres, or more, in size and at times wiping out entire bands of grazing sheep before being controlled or going out of their own accord. In 1931 the General Land Office stated that several million acres of public domain in California needed the fire protection for which their agency had neither the funds nor the machinery setup. At the close of this period the much abused, unreserved public domain was yet very distinctly a no-man's land with a laissez faire form of administration, suppression of fire itself being undertaken on the lands only when protection of adjacent interests demanded it.

### Indian Lands

Almost on a par with the waste lands of the public domain were the Indian allotments. Homes of the Indians were usually unpainted, tumble-down shacks in a setting of sagebrush and sparse tree cover. With incidental employment on the farms of their white neighbors and such government aid as was forthcoming, California Indians were honestly trying to scratch a livelihood from their barren lands.

Official figures for 1925 give an area of only 19,320 acres as being cultivated in the entire State by Indian farmers. The new generation of Indians, submerged though they were, were universally literate and some of the more ambitious Indian youth were beginning to find their way into the higher educational institutions. In 1923, the entire appropriation for California Indian welfare, - for support of the indigent, education and irrigation of their lands, was \$390,300. Five years later this appropriation had dropped to \$324,000, partially because many of the younger generation, inured to white men's customs, were making their own way in the world.

The Indian population of the State in 1925 is given at 18,812, approximately 10,000 of whom were living within the boundaries of reservations in California, with an area of 436,480 acres.



These reservations originally contained 521,285 acres but thru one means or another the approximate sixteen percent reduction in area was taken from Indian use to augment the holdings of the more prosperous white landowners. Of this almost half a million acres of reservation lands, not more than 37,000 acres was irrigable crop land and only two percent of the Indian allotments in the State were irrigated in 1928.

### Farm and Farm Crops

Following World War No. 1, while there was a decided decline in farm land values in the leading agricultural states of the Union, it is a rather significant fact that the average value per acre in California increased rather than decreased. With a rated average value of \$104.67 per acre in 1920, California farm lands were listed as having a value of \$114.67 per acre in 1925.

During this half decade agricultural lands in Texas dropped in average value per acre from \$32.45 to \$27.77, in North Carolina from \$53.76 to \$49.80; in Kansas from \$62.30 to \$50.26; in Illinois from \$187.59 to \$136.65, and in Iowa from \$227.09 to \$148.87. And a lot of farmers from Iowa and other sections of the Middle West, having wrested a fair competence from their fertile lands, were moving to California either to live in retirement or to purchase new farms here.

The California farm population was given in 1925 as 531,000; in 1930 as 579,000. In the latter year the total population of the State had reached an official figure of 5,677,251. However, it is virtually impossible from the mass of various figures to extract the exact number of farms and farmers since urban-rural farms are a common feature of California life, thousands of families gaining almost their entire livelihood from agricultural units of one to two acres in size.

Many retired people with modest incomes also produce part of their livelihood from these pocket sized farms and numerous workers, employed part time in rural or urban pursuits, gain part of their living expenses from their small orchards and gardens. The U.S. Bureau of the Census, whose figures are considered fairly accurate, term as "rural population" all persons living in urban centers of less than 2,500 inhabitants, and at the same time designate a "farm" as an agricultural unit which contains three or more acres of land, unless a smaller unit commercially produces \$250.00 or more per acre per year.

This Federal agency reported in 1925 a total of 136,409 farm units in California, containing 25,517,000 acres, the value of the land structures on such farms being placed at \$3,152,488,000.



The average acreage per farm was 202, a drop of 48 acres in five years. Their figures for 1930 show that the number of farms had dropped to 135,676 but the acreage had increased to 30,443,000 and the total value of land and buildings to \$3,419,471,000. During that five-year period the average-sized farm had increased to 224 acres and the average value per farm had risen from \$23,111 \$23,111,000 to \$25,303.00. The average value per acre of the land included in these farms had dropped meanwhile to a figure of \$112.33.

Professor Oliver E. Baker of the University of California, commenting on the agricultural situation in 1925, stated: "In no other part of the world is agriculture so specialized and diverse as in California." This rural land use authority gives the following analysis covering all California farms that year except those located in the Mountain and Plateau Region:

A total of 47,000 farms under 20 acres, with an average of 9 acres each had an average value of land and buildings of \$10,000 - land \$7,800, buildings - \$2,200; 36,000 farms of from 20 to 50 acres had an average value of \$16,000 - land, \$13,800, buildings - \$2,200; 24,000 farms of from 50 to 175 acres had an average value of \$26,400 - land, \$23,600, buildings, \$2,800; 21,000 farms of over 175 acres, including large estates, had an average value of \$61,000 land \$56,500, buildings \$4,500. About fifteen percent of the total number of farms were operated by tenants and 5,500 large farms by hired managers.

Figures, also compiled by agricultural experts of the University of California, gave the total farm area of the State in 1930 as 30,442,581 acres and apparently recognizing the vital relationship of protected watersheds on which these farming ventures depended, added as an appendage to their report the fact that 19,043,520 acres were included in the national forests. The same authorities gave an analysis of land acreages devoted to livestock farming enterprises as follows:

Stock Ranches -----	14,955,646 acres
Dairy Farms -----	2,703,686 "
Animal Specialty Farms -----	660,689 "
Abnormal Farms - -----	64,203 "
Poultry Farms --- -----	413,529 "
General Farms -----	820,408 "

That California farmers suffered in common with the balance of the nation's agriculturists during the depression years ushered in by the late twenties is shown by the following tabulations of the value of farm production, prepared by the research department of





the California State Chamber of Commerce:

(Farm Sale Value in Millions of Dollars)

PRODUCT	<u>1921</u>	<u>1925</u>	<u>1930</u>	<u>1932</u>
Fruits and Nuts	211	244	259	131
Vegetables	61	89	111	74
Other Field Crops	77	81	79	51
Meat Animals	74	87	75	41
Dairy Products	52	84	90	60
Poultry and Eggs	43	55	72	37
Other Farm Products	<u>4</u>	<u>9</u>	<u>5</u>	<u>3</u>
Totals	522	649	691	397

As will be noted from the foregoing, California agricultural production was steadily progressing until the national depression really hit the Pacific Coast. Figures for the year of 1927 may be taken as an illustration of California crop production. That year, field crops, ranging thru cereals, hay, cotton, sugar beets, alfalfa seed and potatoes, were grown on 4,660,000 acres, the total production volume being 7,769,000 tons with a farm value of \$165,341,000, the average production value per acre being \$35.65.

Hay was the leading field crop that year, 1,6450,000 or an average production value of \$39.13 per acre. Barley was the leading grain crop, 994,000 acres yielding 27,335,000 bushels with a total value of \$25,422,000 and a value per acre of \$25.56. Wheat was still a sizeable California crop in 1927 with 812,000 acres produced 13,642,000 bushels, having a farm value of \$16,098,000, and giving the farmer a return of \$19.82 per acre.

A State total of 128,000 acres produced 45,056,000 bales of cotton and 45,000 tons of cottonseed, the latter rapidly gaining in favor as a concentrated livestock feed. This 1927 cotton crop brought the farmers \$11,150,000 on the basis of average returns of \$87.12 per acre. In the realm of field crops, hops showed the greatest return per acre, the intensively-used 6,000 acres on which this crop was raised producing 9,900,000 pounds, valued at \$1,980,000 and having an average value per acre of \$330. Potatoes were also high acre-value crop, 7,956,000 bushels, worth at farm prices, \$7,558,000, being harvested from 52,000 acres. Potato growers were rewarded with an average State-wide return of \$145.35 per acre.

It is an interesting fact that the lowly potato, native son of America, which revolutionized Irish agriculture and has proven its extreme versatility in Europe during two major world conflicts,





also proved its adaptability to a California environment. The great potato producing regions of the nation have a climate very dissimilar to that of California, nevertheless, the crop is grown in almost all sections of the State. The area planted annually varies considerably. A total of 70,000 acres in the State was producing this crop in 1920; 76,000 acres in 1922; 43,000 acres in 1925; 56,000 acres in 1928, and 35,000 acres in 1930. In 1920 California accounted for 17.8 percent of the Nation's potato production, in 1922 for 17.6 percent, in 1925 for 13.8 percent, in 1928 for 14.6 percent, and in 1930 for 10.3 percent.

The average potato yield per acre in California increased from 78 sacks per acre in 1922 to 99 sacks in 1930. The national average ranged from a low of 66 sacks per acre in 1920 to a high mark of 88 per sacks per acre in 1930. San Joaquin county led the nation in potato production per acre in the latter year with an average per acre yield of 326.2 bushels. Aristook County, Maine, produced an average of 314.8 bushels per acre and Yakima county, Washington, 258.6 bushels per acre. That same year the entire Shafter district in the San Joaquin Valley produced an average potato crop of 350 bushels to the acre and shipped 7,500 carloads to the nation's markets.

On the sandy soils of the Federal Klamath Reclamation Project, straddling the California-Oregon line, without any benefit of Japanese farmers, potato yields were enormous. In the short frost-free growing season of that section white farmers produced the Klamath Netted Gem potatoes which commanded a premium in the world's markets.

In 1927, California vegetable growers realized \$64,158,000 from this type of crop, grown on 354 acres. Returns to growers per acre ranged from \$53.50 for watermelons and \$80.00 per canning peas, up to \$377.78 for green canning beans and \$397.82 for table asparagus. The acreage in asparagus that year was 58,380 with a production of 53,100 tons for canning, and 1,341,000 crates of the table variety.

Lettuce in 1927 was grown on 34,400 acres in the Imperial Valley and on 42,010 acres in other sections of the State. The State production of this crop that year was 9,627,000 crates, valued at \$15,381,000 on the farm. Tomatoes, another American-born vegetable (or fruit), produced for sale fresh or for canning, were harvested that year from 51,510 acres, the total production being 226,648 tons, worth \$4,771,000 at the point of production. And down in Imperial Valley in 1927 growers received \$14,233,000 for crops of lettuce grown on the 34,400 acres and for the melons grown on 45,260 acres of these converted desert lands.



Vegetable farming in California was virtually a monopoly of the Japanese, firmly entrenched on California lands. The bulk of the wealth realized by these alien farmers promptly found its way over the sea to Japan, the Oriental tenant farmers making only the necessary expenditures for their seed, fertilizer and frugal living expenses within the communities in which they had established themselves.

California fruit and nut production continued to expand by leaps and bounds as new areas of orchards were developed. In 1927 the total area devoted to this class of farming, including deciduous and citrus fruits, nuts, olives and grapes, was given as 1,685,300 acres; the total production at 3,883,000 tons, and the value of the crop at \$220,221,000 on the farm. For the entire State the average value of production per acre was stated to be \$130.67. Fruit farming had increased from an area of 1,180,000 acres as listed in 1920.

The greatest acreage of the orchard type of farming was that devoted to oranges, 185,543 acres producing 22,540,000 boxes of this fruit with a value in the groves of \$67,620,000, and an average production value of \$364.44 per acre. Prunes covered 165,200 acres, produced 190,000 tons of fruit, with a total value of \$13,300,000 and returned an average income per acre of \$80.51. Peaches were another leader that year, the 427,000-ton yield on 150,822 acres having an orchard value of \$10,657,000, and bringing the growers an average of \$70.78 per acre.

Lemons showed the greatest return per acre, the average value being given as \$407.61. The total area of 43,179 acres of lemon groves produced 6,400,000 boxes of fruit, valued at \$17,600,000. In 1927 also, 87,074 acres of almonds produced 12,000 tons, valued at \$3,800,000, and paid the growers an average of \$44.10 per acre. English walnuts brought in handsome returns. An area of 74,723 acres devoted to that crop yielded 42,000 tons, worth \$15,120,000 with an average value per acre of \$202.34.

Table grapes showed an average return per acre of \$62.15; raisin grapes, \$76.99, and wine grapes, \$127.66. In 1927 the total area devoted to all classes of grapes in all sections of the State was 622,104 acres. The total production was 1,409,000 tons, valued at \$57,152,000.

The foregoing figures on 1927 California crops represent f.o.b. farm prices. These values greatly increased when fruits, nuts, vegetables and other farm products were processed in the canneries or packing plants for local or distant marketing. According to data furnished by the California Fruit News and the Canners League of California, food products grown on California lands had in-





increased from a figure of \$152,000,000 a few years previously to \$600,867,000 in 1925. Illustrating the growth in output of canned fruit and vegetables, figures show that the State total in 1909 was 4,931,778 cases. In 1919 this output had increased to 20,747,942 cases; in 1925 to 24,159,743 cases, and in 1926 to 30,521,975 cases. As perhaps a forerunner of the dawning depression years, the California cannery output total dropped to 25,304,615 cases in 1927.

Processing of local meat products had risen to a high place in California. Approximately 550,000 beeves; 75,000 calves, 1,600,000 sheep and lambs and 1,000,000 hogs passed thru California's meat packing and slaughter houses in 1926. The total output of these establishments the previous year was officially valued at \$115,787,976. The average annual number of feeder cattle shipped into California from some 15 other States was 368,000.

As indicative of the values added by manufacturing processes, it might be mentioned that in 1923 the producers were paid - in round figures - 562 million dollars for agricultural products; 344 million for minerals, including oil; 87 million for lumber (sawmill) products, and 12 million for fishery products. In the process of converting these raw materials to marketable merchandise, to this figure of one billion, five million dollars, manufacturers added 932 million, creating a final value of \$1,937,000,000.

In 1927 producers' compensation at the production point was agriculture, 634 million dollars; oil and minerals, 434 million, lumber products, 73 million, and fishery products, 18 million. To this the manufacturers added 968 million, resulting in a final value of \$2,127,000,000. Of course, producers at the source and manufacturers were often synonymous, as in the case of the farmer marketing cooperatives and large oil concerns. Considering the fact that some part of the raw materials went directly from the producer to the consumer, it would seem that the land users and the urban processors of their products shared about equally in the gross revenue coming from the California lands.

As has been mentioned, California farming was largely a series of specialized enterprises many of them having no parallel anywhere in the world. New types of agricultural ventures were continually coming into vogue and new methods of farming constantly being developed.

The trend towards large vegetable farms of 2,000 acres or more commenced during the first decade of the century. These farms, in spite of the somewhat marvelous and unusual labor-saving machinery used in their operation, called for hordes of labor. Altho poorly paid and usually on a piece-work basis, fruit pickers,



sugar beet field workers, and field and orchard laborers in other crops: often developed adeptness and techniques which sometimes actually placed them in a skilled labor class.

In the immense poultry industry centering around Petaluma in Sonoma county, one of the main branches of the industry was the production of day-old baby chicks, shipped to all parts of California and neighboring states. One hatchery alone in that section produced two million chicks annually. As part of their marketing practice, hatcheries guaranteed that 97 percent of the baby chicks were pullets and in eventual checks this percentage of female birds ran still higher.

To meet the requirements of this industry, there was developed a type of employees known as "sexers" - boys trained in their teens to grade newly-hatched chicks by sex. The difference between male and female baby chicks is not discernible even to a rather careful observer and the young men employed in this work required super perfect vision and cool nerves. These employees rarely make an error altho they seem unable to explain their rather uncanny skill to an outsider. Paid at the rate of one-half cent per bird, they earned \$100 per week, or more, during the lengthy hatching season. None of this class of employees is over twenty-five, since upon reaching that age they cannot be counted upon for more than 80 to 85 percent efficiency.

In the same California county that great lover of the land, Luther Burbank, continued his study with plants until his death in 1926. The miracles he performed startled the world. The Carnegie Institute some time previously had arranged to pay him \$10,000 a year to continue his experiments, altho financial remuneration meant little to the great plant wizard. Demands for new species of plants and trees produced by this hybridization experiments poured in from all quarters of the globe. While his work covered a wide range of flowers and ornamental plants, agriculture is perhaps more indebted to him for his production of some forty new species of plums and prunes, the great Burbank potato and numerous varieties of peaches, nectarines, apples, peas, tomatoes, corn, asparagus and other farm crops.





Burbank spent 16 years alone in perfecting his famous spineless cactus which, adapted for succulent livestock forage in arid regions, produced almost fifty pounds per plant and ninety tons to the acre. California's Luther Burbank, probably more than any other man before or since, proved that Nature at her best could still be improved upon by the science of man.

Sixty percent of all the oranges and eighty percent of all the lemons consumed in the United States and Canada are produced in California. Not all citrus fruits are grown in that section of the State definitely classified as Southern California. The range of citrus fruit extends clear north to the upper end of the Sacramento Valley. Approximately one-eighth of all California oranges are grown north of Tehachapi, mainly in Tulare County. Altho not so famous as those grown on the Southern California Coastal Plain it can be said of the Tulare oranges that they ripen earlier because of the higher summer temperature.

There are some peculiar facts concerning these introduced citrus fruits, the production of which takes fourth place in magnitude in California's industries, being exceeded in revenue produced only by oil, tourists and motion pictures, in the order named.

The lemon harvest lasts the year around, the trees blossoming and bearing both ripe and green fruit during all seasons of the year. The same can be said to a large extent of the Valencia orange, altho this fruit normally ripens from November to May. Quite frequently blossoms, green fruit and ripe fruit are all found at the same time on the Valencia tree-sometimes even on the same branch. A peculiarity of the Valencia orange tree is that it can be used as its own storehouse, since ripe fruit can be left on the tree for months without deterioration.

Strangely enough, the great Washington Seedless navel orange of California is actually a synthetic tree. Since it has no seeds, it is unable to reproduce itself. Buds from the navel orange trees are grafted on to another species of citrus tree when the latter is about a foot high. It is possible by this grafting practice to make a lemon or grapefruit tree over into a navel orange.

Mention has been previously made of the pollenization use of the wild fig by local fig growers. Broods of the tiny insects of the wild caprifig of north Africa and Italy were imported to form the nucleus of California's fig pollenization agents. During the twenties the white Kadota fig replaced to a large extent the black Mission fig for preserving and canning.



Melons of all varieties had long been a successful California crop, particularly in the Imperial and San Joaquin Valleys. A rather strange problem developed in connection with watermelon production in the latter region from the fact that the fruit, if left alone, grew too large for popular marketing, some of the melons reaching a weight of as much as one hundred pounds each.

Rice, which had become an important crop in the Sacramento Valley, was tried in an experimental way in the San Joaquin Valley in 1910 and again in 1915. In 1927, several thousand acres were planted southwest of Merced. Rice culture requires an abundance of water but it can be grown on soils with a shallow underlay of hardpan, not well suited for other crops, since this type of soil retains the water. It also has the faculty of reclaiming lands which have become impregnated with alkali. Generally, it is grown on the same lands for three or four years in succession, then the land is fallowed, or "rested," for one year.

One of the most tender and sensitive of California's sub-tropical fruits, the avocado, began taking its place in the twenties as a rather important orchard crop. As late as 1921, avocados brought growers from sixty cents to one dollar a pound. In 1927 some 700 acres were producing this fruit. Four or five years later the avocado acreage had risen to ten times this figure and a special cooperative, the Calavo Growers of California, was handling the bulk of the crop.

Other rather unusual fruit crops pretty firmly entrenched by the late twenties and occupying, in the aggregate, a considerable land area, were persimmons, guavas, pomegranates, quinces, loquats, citrons and even the tropical mango. And down in Coachella Valley, northern arm of the rehabilitated Imperial area, date production was coming into prominence. Date palms took kindly to the soils of the sub-tropical region. That the date industry was not developed earlier was due to the voracious appetite of the date palm for water, an acre of dates requiring six to ten acre-feet of water annually.

In 1929, 46 of the 58 counties of California had each more than a minimum of 1,000 acres of some kind of fruit crop growing on a commercial scale.

Cattle production in California dropped somewhat from the peak reached during the years of World War No. 1 and in the winter of 1932-33 the total number of meat cattle in the State was estimated at 1,926,000, of which some 625,000 head were dairy stock. Sheep, which were to slide down in numbers about one-third during the next half decade, were estimated at a total of 3,846,000 in 1929.



In 1929 a survey showed that sixty percent of all California lands were yet devoted to livestock grazing. The figures of a previous decade which listed fifteen million acres of California land as tillable remained fairly constant.

California idle land continued to loom large in the State picture. The State Division of Water Resources gave the following summary of major land types in 1930:

Timberlands . . . . .	16,200,000	acres
Brush and Woodland . . . . .	16,600,000	"
Open Grassland . . . . .	27,500,000	"
Desert and Sagebrush . . . . .	24,900,000	"
Crop Land:		
Irrigated,	3,500,000	acres
Non-irrigated	4,900,000	"
	8,400,000	"
Urban Area . . . . .	1,200,000	"
Miscellaneous . . . . .	4,700,000	"
	<hr/>	
Total	95,500,000	"

The California Blue Book of 1932, in a summary by counties, stated that there was a total of 51,990,140 acres of land on the State's assessment rolls, with a grand total assessed valuation of \$9,015,717,507. The assessed value of real estate, (land alone) was set at \$3,786,492,171. As indicative of the large volume of the idle lands in this total of assessed valuation, the assessed value of non-operating property was placed at \$7,951,084,993 and that of operating property at \$1,134,632,514. It must be borne in mind, however, that this was one of the peak years of national and State industrial and agricultural depression.

The Official Farm Advisor

The Smith-Lever Act, passed in 1914, created cooperative agricultural extension work. California was somewhat slow in taking advantage of the county farm advisor, or county agent system which this agricultural measure brought about. The first county farm advisors were appointed in the State during the early twenties and with the multitude of problems involved in the complex pattern of California agriculture it was not long until most of the large agricultural counties had joined with the first ones in securing appointment of such officers. By 1924, forty-one of the leading agricultural counties had official farm advisors and as companion workers, thirty rural homes demonstration agents also. Some of the mountain counties of the State where the livestock industry predominated provided for farm advisor's offices as well.





The value of the work of the Agricultural Extension Service and its farm advisors to rural land users can hardly be overestimated. What the forest ranger was to the wild lands and the mountain areas, the farm advisor was to agriculture. The qualifications for the position were extremely exacting. Men selected for the work were practical farmers to begin with and were educated and trained in all technical phases of agricultural effort. The inauguration of this work in rural communities came at an opportune time. During the depression years farm advisors carried the torch of hope in hundreds of farming communities, advising, demonstrating, and initiating new ventures or new methods of handling old enterprises.

Working hours meant nothing to these rural public servants who often labored the clock around and within their zone of operations were at every farmer's beck and call. In their efforts to break down age-old prejudices and customs, often proven useless in the light of modern farm science, county farm advisors frequently encountered bitter antagonism. However, their advice, invariably based on practical demonstration as they showed one farmer or one group of farmers what another farmer or group had accomplished, usually resulted in a distrustful attitude changing to one of confidence and cooperation. With their major goal better land use practice, they also accomplished much in creating a fuller rural social life thru Farm Bureaus, 4-H Clubs, Granges and other cooperative farm organizations. Its personnel, carefully selected for their ability to deal with emergencies in rural economic and social life, the Agricultural Extension Service, essentially local in its operation, had become a mainstay of California agriculture.

### California Waters

Water - its need, - its lack, its distribution, and its application to the soil, continued to be the great major land use problem in California. Thru more than half a century the State had considered the various schemes for State-wide water development and distribution of water but no all-inclusive plan had yet been settled upon as irrigation continued to be represented by a complicated network of projects, private, municipal, State and Federal. Except for those served by the Federally-operated projects and to a lesser extent by those within the successful districts organized and operated under the much amended Wright Law, water laws and water rights problems continued to harass the land user.

In 1921 the State Legislature appropriated \$200,000 for a broad, comprehensive survey and study of the State's water resources. The State engineer reported the progress of the work to date to the legislative body and, impressed by the magnitude of the joint





problem of water conservation, flood control and irrigation needs, additional funds were provided by the legislators and the State engineer instructed to continue the job thru to completion.

It was not until 1931 that State Engineer Edward Hyatt, following ten years of intensive investigation, submitted to the State governing body a final detailed, State-wide plan for water conservation, development and use. With a few minor changes this plan was adopted -the harbinger of the great Central Valley project and smaller water projects on streams thruout the State. In this thorough-going, intensive water inventory some interesting water facts were discovered by the State officials and the cooperating Federal agencies working with them.

The value of California's ranges in their function as enormous water storage sponges was conclusively proven. The State was also very much concerned over the soil losses by erosion which it was shown had been brought about by a combination of uncontrolled water and misuse of both agricultural and wild lands.

Investigators found that a thick, matted stand of bluegrass on gently sloping fields would absorb 99 percent of the rainfall and a well-covered forest floor 95 percent.

Wheat and rye fields bearing an average crop would absorb not over 60 percent of the falling moisture and open-row crops such as corn and beets approximately 40 percent. While a 20 percent brush-covered slope of the typical Southern California type would retain 75 to 85 percent of the total moisture descending upon it, a bare slope of a scant three percent would absorb practically none at all of the falling rain.

During the State-wide study, one body of the investigators, reporting on Southern California water problems, stated that while the territory south of Tehachapi embraced twenty percent of the State area favorable for human habitation, it possessed a little over one percent of the State's water resources, exclusive of the Colorado River and its tributaries. They called attention to the fact also that this area, while having such a disproportionate share of the waters originating within the State boundaries, had experienced a rapidity of settlement which had amazed the world. Already, this report stated, one-fifth of this area possessing a water supply on the Pacific slope, lay within the limits of incorporated towns and cities and that this ratio was constantly growing larger.

In the great central valley of 12,160,000 acres, the amount of land irrigated by well pumping had greatly increased and by 1929



in this big flat land area it was estimated that water pumped from wells took care of twenty-eight percent of the irrigated land of the State. It was in the great Valley of the Sun, as the San Joaquin Valley is sometimes called, that irrigation pumping equipment reached the greatest development of any place in the world. A six-inch power pump used in the twenties would throw a stream of 900 gallons of water per minute. Low lift pumping, either for drainage or to lift water to a higher level, was revolutionized here in 1933 with the invention by Wilfrid Larson, local irrigator, of the Larson Box Booster Pump.

Of course, this prevalent use of underground water was constantly lowering the water table but as has been previously mentioned, in the quite frequent cases where gravity water could be obtained as a supplement, the water level again rose. During the State water study it was found that 60 to 70 percent of the water applied to the land eventually found its way back to the streams or to the underground channels, this amount being dependent upon the nature of the soil and crops. Only 25 to 40 percent of the water was utilized by growing vegetation or lost by evaporation.

Shortly after the investigative program was started in 1931, the State Division of Water Resources made the following preliminary estimate of ultimate annual water requirements, figuring that eighty percent of the gross irrigable agricultural area of the Interior Valley Region would eventually be brought under irrigation:

North Pacific Costal Area . . . . .	1,011,000	acre-feet
Sacramento River Area . . . . .	15,864,000	" "
San Joaquin River Area . . . . .	13,326,000	" "
San Francisco Bay Area . . . . .	1,735,000	" "
Central Pacific Coast Area . . . . .	1,540,000	" "
Southern Pacific Coastal Area. . .	3,340,000	" "
Great Basin Area . . . . .	<u>10,000,000</u>	" "
Total	46,816,000	

The State investigators found out that in 1924 there was irrigation construction and water supply already provided for a total of 6,200,000 acres within the State, of which 1,500,000 acres were unirrigated that year. This raised a doubt in some quarters as to whether water development had not progressed beyond the point of need for agricultural land use. However, the actual irrigated land area had increased in volume from 2,664,000 acres in 1910, and from 4,219,000 acres in 1920.



For that same year in their 1925 report the United States Bureau of the Census presented the following figures covering a general classification of California farm lands:

Crop land harvested in 1924 .....	5,722,800	acres
Crop failure... ..	984,900	"
Idle or fallow land .....	<u>1,693,642</u>	"
Crop land total .....	8,401,342	"
Plowable pasture... ..	3,033,414	"
Woodland pasture.....	4,227,934	"
Other pasture .....	<u>9,610,287</u>	
Pasture land total.....	16,871,635	"
Woodland not used for pasture .....	437,489	"
Other pasture .....	<u>1,806,489</u>	"
Total area of land in farms .....	27,516,955	"

It will be noted from the Federal enumerators' figures that but slightly over thirty percent of the total farmland area was classified as crop land in 1924, and slightly less than twenty-one percent of the total area included in farms actually produced crops. This is quite indicative of the large volume of land held in idleness for speculative purposes as well as the big area of submarginal lands entered or patented under the various land laws. In comparison with the State figures, the combined tabulations indicate that only about 56 percent of California crop land was irrigated in 1924.

In 1928 the State Department of Agriculture, which had replaced the State Board of Horticulture, produced the following rather ambitious figures: as a general classification of California lands:

Tillable land in valleys .....	19,171,200	acres
Tillable land on plains .....	2,045,000	"
Tillable land in foothills area .....	<u>2,695,000</u>	"
Total tillable land .....	23,912,000	"
Timbered Area .....	19,195,000	"
Other Watershed Cover .....	10,650,000	"
Remaining Area .....	<u>45,860,180</u>	
Total Mountainous or other Area .....	75,705,180	"
Total land area in State .....	99,617,180	"





Conceding the fact that these State statisticians of 1928 were even approximately correct, - and most land use experts agree that there are at least fifteen million acres of actual and potential farm land in California, - water was available for a comparatively small percentage of the arable land, and water was the controlling factor in agricultural land use.

We find the Bureau of the Census in their 1930 report making the following official statement relative to irrigated farm lands in California:

Irrigable Area covered by Irrigation Enterprises	8,075,895	acres
Area such Enterprises were able to supply with water in 1930 .....	6,815,250	"
Total area irrigated .....	4,746,632	"
Area irrigated and actually producing crops ....	3,540,350	"

Up to 1930 these official statisticians estimated that 450 million dollars had been invested in irrigation works in the State to date.

There was obviously a wide range between the twenty-three million odd acres estimated to be actual or potential farm lands and the approximate four and three-quarters million acres of land to which water was being applied. It is little wonder that California land boosters, colonization organizations and realtors generally could nationally advertise, with official figures to back them, the fact of millions of acres of arable California lands yet untouched by the plow.

Irrigation districts, officially organized under the Wright Act, now known as the California Irrigation District Law, continued to show quite favorable progress, altho this method of organized irrigation covered less than thirty percent of the total land area of the State involved in irrigation enterprises - Federal, State, county, municipal and private. The following tabulation of the official State irrigation districts shows their status in the twenties:

	<u>1925</u>	<u>1928</u>
Total Number of Districts	63	89
Total Acreage of Districts .....	2,699,462	3,540,852
Present Irrigable Area (Acres)	1,875,980	2,434,183
Ultimate Irrigable Area "	2,243,262	3,035,927 in
Area Actually Irrigated "	1,445,786	1,634,183 (1927)
Percentage of Irrigable Area Irrigated.....	77.21	67.14
Capital Invested to Date	\$ 93,442,993	\$111,325,057
Total Capital Required to complete present bonded debt	129,377,66;	146,849,620



Over one-third of the number of California farms, or 57,525, were included in these 89 districts organized and operating under State supervision and control. The estimated population of the districts in 1927 was 330,920, of whom 213,900 lived outside cities and towns. The largest project in area was the Imperial, with 389,048 acres under irrigation in 1927 and representing 5,062 individual farm holdings. Next in area was the Fresno district with 193,539 acres, embracing a total of 9,021 farm units. The smallest district was that of San Ysidro in San Diego county with only 457 irrigable acres but containing 400 small land holdings, one of the rural-urban developments mentioned previously as the Little Landers project. The Walnut project in Los Angeles county, however, was strictly an agricultural enterprise, although its 59 farms contained but 900 irrigated acres.

In these State-supervised irrigation districts water charges were assessed under different methods, on the basis of volume used, or by flat acreage rates, and varied greatly in amount. In 1927, one alfalfa and grain district paid an annual rate of \$15 per acre and the same year one rice district paid the still more prohibitive price of \$23.80 per acre. A flat rate of \$5.00 per acre represented the Imperial project charge while on the big Fresno project this annual charge was exactly half that amount. The State Division of Engineering and Irrigation estimated that the average basic cost of original water development per acre, spread over all the 89 districts, was approximately \$51.00.

Up to January 1, 1929, a total of \$105,186,661 California Official Irrigation District Bonds had been sold. Of this amount, \$1,125,000 had been refunded, \$6,774,724 redeemed and \$97,286,937 were outstanding.

The bond principal, in default on that date, amounted to \$348,000, or only about one-third of one percent of the total bonds sold and about 4.9 percent of the par value of the bonds which had become due. Southern California proper, outside of the Imperial Valley area, with its own water problems and irrigation systems, did not seem to take kindly to the State-supervised Wright Act method of irrigation. In 1925 under the State irrigation law there were only nine districts south of Tehachapi, involving 27,300 acres of land. The bonded debt per acre in these districts ran around \$96, as against \$5.89 in the Kings River district, \$45.95 in the heavy water-using rice growing areas, and the over-all State average of \$30.84 per acre.

Irrigation continued to sound a decidedly cooperative keynote in rural California and considerable consolidation took place among the districts during the latter thirties. One striking example was the Consolidated Irrigation District in the south central



San Joaquin Valley, which was formed in 1930 by a merger of several smaller districts. The new district took in the intensively-used lands in the communities of Fowler, Selma, Kingsburg, Del Rey, Sanger, Parlier, Caruthers, Monmouth, Bowles and Conejo, with a total population of 24,000 and a total area of 149,000 acres. Incidentally, its prime mover and superintendent was the same William H. Shafer who had occupied a similar position with its component system half a century previously. Three years later, this consolidated district included 300 miles of main canals in its irrigation system.

King's River was the source of water for this big joint district, as it was for a total area of close to two million acres, 1,100,000 acres of which was actually being irrigated in 1930. That year the annual report of the State engineer pointed out that this same Kings River furnished more irrigation water than any other stream in the world with the exception of the Indus River in India and the Nile in Egypt, each of which watered approximately two and one-half million acres of land.

### The Great Colorado

The largest of the official State irrigation districts, the Imperial, where George Chaffey had paved the way for the transition of the sun-baked desert to one of the most productive farm areas in the United States, progressed rapidly. In 1922-23, the irrigators of that remarkable valley sponsored a bond issue of twelve and one-half million dollars, thru the medium of which they were able to take over the distribution canals formerly operated by mutual water companies. Levees were being built to hold the turbulent Colorado in check, since it yet periodically went on the rampage, its floods washing away man-made improvements as though they were child's toys and spreading almost countless tons of silt over the hard-won fields.

The cost of the over-all cure for the joint problems of flood control, silt control and storage of water for irrigation and hydro-electric development combined, was beyond the capacity of the Imperial District's purse, or California State finances. However, the miraculous growth of the Los Angeles section and its satellite areas helped matters. Los Angeles was again crying for more water and since the bringing of the Colorado water to its doors was an engineering possibility, the great Southern California coastal plain joined the Imperial section in the pressure on the Federal government to do something about the matter-on the basis of a sound financial, cold-blooded business proposition.







Taming of the mighty Colorado River and the diversion of its excess waters to thirsty Southern California lands became an obsession with the people of that section of the State and their representatives in Washington as they fought to secure Federal sanction and Federal funds for the construction of the world's biggest water enterprise. Their efforts were successful and the Boulder Canyon Project Act was signed by President Coolidge on December 21, 1928 assuring eventual flood and silt protection, an ample water supply for Imperial Valley, and water and electric power for other Southern California areas.

The Boulder Dam project, called the Hoover Dam in its earlier stages of development, was to cost 165 million dollars, of which the Reclamation Service was to spend thirty-eight and one-half million of the funds allocated them for the project to complete the All-American Canal. The cost of creating this man-made river, all on desert lands within American territory, was to be repaid to the Federal government by the irrigators of the Imperial and Coachella Valleys on whose lands the water was to be used.

Further on in these pages further details will be given on the great Boulder Dam project and some account of the great aqueduct thru which its waters were brought to thirsty Southern Californians to the north and west. Meanwhile, without the benefit of this dawning development, by 1929, according to cooperative reports of the U.S. Bureau of Reclamation, the State Engineer's office and the State Board of Equalization, the Imperial Valley was already doing very well. This combination of arid lands and Colorado River water had developed a property valuation of \$137,422,677, and a local population on the former desert of some 50,000 people.

#### Hydro-electric Development

During the 1920's irrigation's twin factor of water use, hydro-electric development, marched along with magic strides. As a matter of fact, the electric power companies, large and small, in harvesting the mountain streams primarily for hydro-electric development, were also among leading distributors of water to the farmers for irrigation purposes.

In 1920, the Southern California Edison Company alone sold water to farmers or furnished power to operate their well-pumping equipment for the irrigation of approximately 600,000 acres. Further back, in 1916, the Mt. Whitney system of this concern was furnishing power for irrigation plants which spread water over 67,480 acres and that same year 86 percent of all the power produced by that one unit of their far-flung system was furnished for irrigation pumping, or for other agricultural uses.



Altho municipal and private power plants were in operation all over the State, the bulk of the electric power in California was produced by ten large corporations, operating under the cognizance and control of the State Railroad Commission. The four largest concerns whose distributing lines were like giant spider webs covering the most thickly populated agricultural sections, were the Pacific Gas and Electric Company and the Great Western Power Company in the northern part of the State, the San Joaquin Light and Power Company in the central area and the Southern California Edison Company in the southern section.

So powerful had these companies become by the third decade of the century that they could practically write their own tickets in the matter of charges to the consumer, with the people's railroad commission acting as virtually the only buffer. Certainly, in spite of the widespread use of electric energy in the rural districts, we find the farmers complaining that the rates to users were much higher than those charged by the Canadian companies in the sister nation to the north.

In Southern California, the Southern California Edison Company had a close competitor in the outstanding Bureau of Power and Light of the City of Los Angeles. In 1927 this municipally-owned public utility had assets of over seventy million dollars and served 230,000 customers. By that same year also the Big Creek plant of the Southern California Edison Company had cost 200 million dollars, the project reservoirs stored 300,000 acre-feet of water and the plant generated 566,000 horsepower. The total operating capacity of this company alone was well over a million horsepower, about fifty-five percent of which was generated by water power.

Besides adjacent rural areas the Southern California Edison Company was serving over 300 cities, towns and villages. Their territory covered some 55,000 square miles with a population of two million. Almost one-third of their total output was consumed for industrial use; eleven percent for lighting and cooking; sixteen percent for railways; fourteen percent for agriculture, the balance going to municipalities for **rosaló**.

In the northern area of the Sierra Nevadas, the Great Western Power Company with its plants located on the Feather River, had created artificial Lake Almanor with a capacity of 1,300,000 acre-feet, as a part of its 200-million dollar development. The Pacific Gas and Electric Company at the same time was rendering service in thirty-eight counties in the northern and north central sections of the State.



In 1902 the total investment in hydro-electric development in California had been \$36,500.000. By 1920 the figure had reached 408 million dollars with a production of one million horsepower. In that year almost three thousand miles of interurban electric railroads were serving rural and urban-rural sections of the State.

The plants themselves with their huge storage reservoirs and the long, high power transmission lines leading out of the Sierra Nevadas, represented huge investments and by 1925 the fixed capital of hydro-electric concerns in California had reached a figure of 760 million dollars. The sales of electric energy that year brought in a total of ninety million dollars.

The volume of output of electric energy in California for 1927 was given as follows:

<u>OPERATION</u>	<u>HYDRO</u>	<u>STEAM</u>	<u>TOTAL</u>
	(In Kilowatt Hours)		
Southern Calif. Edison Co.	2,168,339,000	241,530,000	2,409,869,000
Pacific Gas & Electric Co.	1,484,414,000	15,567,000	1,499,981,000
Great Western Power Co.	668,684,000	7,710,000	676,394,000
San Joaquin Light & Power Co.	499,132,000	5,299,000	504,431,000
State total, including all others besides above	6,772,031,000	663,561,000	7,435,592,000

#### Magnitude of Water Problem

California's "white gold of the mountains," - water - was the factor on which the State's whole social structure was built. Dr. Elwood Mead, after championing the cause of water development in the State for many years, in leaving for a larger national field of action, wrote: "No state has gained more than California from the artificial application of water or has more at stake in the extension of its use."

Legal water rights were still a nightmare to the California rural land user. Riparian owners were not prone to surrender the rights conferred upon them by the law of the land, - the old English common law on which the California law was based and which made it illegal to intercept the flow of water in a live stream. Speaking of the tangled water rights and fights of this and earlier periods,





Wallace Smith, in his interesting history of the San Joaquin Valley, published in 1939, has this to say:

"Riparian rights were judge-made; appropriation rights were legislative-made. Irrigation law in California proceeded to march in double time in both directions at the same time. No wonder that dams were built and blown up, that irrigationists and cattlemen fought and won and lost all at the same time, and that even the lawyers became dizzy."

In the case of Gin S. Chow et al, vs. the City of Santa Barbara, initiated on August 6, 1928, the California courts really took the bull by the horns, so to speak, and made a common sense ruling on water rights which established a precedent from the Oregon line to the Mexican border. For three years as the case was fought thru the courts it held the breathless attention of water users thruout the entire State.

The City of Santa Barbara, experiencing a growth and development somewhat commensurate with other Southern California communities, was in a rather bad way to supply water for its growing population. Meandering through the mountains above this beautiful California city was the Santa Ynez River, a large stream as California rivers go, and down which during the winter season rolled thousands of acre-feet of water, to be lost in the limitless area of the Pacific Ocean. Moreover, like other Southern California streams, during periods of heavy rainfall the Santa Ynez went on the rampage, carrying thousands of tons of silt and debris to spread over and add to the total acreage of fertile lands so ruined throughout the State.

The city of Santa Barbara projected the construction of a storage reservoir on lands within the adjacent national forest which had been given to the municipality by the Federal government some four decades previously. This reservoir, built on the upper reaches of the Santa Ynez River, would not only provide ample water for the community's use but would also act as a safeguard against flooding and silting of lands further downstream. In the carrying out of their project when the city authorities filed on surplus waters under the riparian law, the water users owning lands along the stream objected to the use of the water and a typical California legal water fight ensued.

On December 22, 1930, the court upheld the right of the City of Santa Barbara to store and use flood waters of the Santa Ynez River over and above the normal flow of the stream, which normal flow at the same time was secured to the contestants under the riparian law. In other words, the principle was now established by law that riparian rights referred to the normal flow of the



stream on which they were based and not to excess waters being wasted when the stream was in flood.

This famous case, later upheld by the supreme court in its decision of April 3, 1933, more or less automatically decided other similar cases in the State. At last California had declared illegal the dog-in-the-manger attitude of many riparian owners who would lock up against use excess waters not needed by themselves.

Water experts of the twenties hazarded a modest guess that three hundred billions of tons of water fell across the State in the form of rain and snow in an average winter and that sufficient water was stored in the backbone mountain range of California to cover the entire central valley to a depth of four feet. Sometimes millions of dollars were spent in projects to control floods after they had reached the vulnerable valley and urban points, projects which had as their sole purpose the passing on of the silt-laden waters to the ocean rather than with thought of storage for future use. This was particularly true in Southern California where winter floods were a constant menace.

Besides the Federal investigations already made, California's water problems were sufficiently acute to bring about the appointment in 1931 of a special congressional investigation committee. This committee, functioning mainly in behalf of the Department of the Interior, was headed by the Hon. Frank Murphy of Ohio and made a pretty exhaustive investigation on the ground, endorsing plans proposed by the War Department and Bureau of Reclamation. These plans called for the extension of existing water projects and the development of new ones at a cost of \$373,700,000. Murphy's proposals included both irrigation and flood control, as well as improving the navigability of the Sacramento and San Joaquin Rivers. The report definitely recommended Federal aid and cited figures to show the expected financial returns and the soundness of the investment.

Extracts from an appeal to save water at its source, made by Dr. Geo. P. Clements, head of the agricultural department of the Los Angeles Chamber of Commerce, in speaking to a national convention of conservationists meeting in Los Angeles in the spring of 1932, are well worth quoting. Emphasizing the continually increasing soil erosion which had already destroyed millions of acres of the most highly productive lands of the nation, he said in part:

"There is not a foot of agricultural or civic property in the whole United States but must look for its present security and its permanency to watershed management and control . . .



Millions of dollars have been spent in dams, reclamation projects, private and public, in an endeavor to circumvent this destruction without, however, taking into consideration the elementary causes or to any great extent obstructing them . . .

Our agriculture, industry and commerce are totally dependent upon a certain and unfailing supply of sweet and potable water. Such a supply is totally dependent upon the health and well being of our mountain and foothill watersheds . . .

California's great investment in agriculture, industry and commerce amounting to more than 8 billion dollars, 3-3/4 billion of which is agricultural; all our social, educational and recreational and accomplishment which with our climatic conditions constitute the fetish which draws temperate America and much of the world to us; our present prosperity and our program for the future, are entirely dependent upon our annual raincrop.

The husbanding and harvesting of this rain crop is therefore our greatest responsibility,

The forest and brushclad watersheds of California are her most sacred possession, a most precious heritage, since they are the fount from which we draw all our being, our strength and security . . .

Upon the health of the watersheds of the State depend the health and permanency of California's economic structure, particularly that of agriculture. These watersheds, well clothed in timber and brush, are her only security for her agricultural, civic and industrial development or the present important position she has assumed in all three.

California has expended millions of dollars in the necessary storage and control of her waters for agricultural, civic and industrial development, and this expenditure will be wasted effort unless the health of these watersheds is maintained. Erosion - due to disastrous fires and resulting floods - has already filled many reservoirs, destroying their utility, inundating thousands of acres of agricultural lands and rendering them worthless . . .





The uncontrolled waters rushing to the ocean instead of filtering into the under-strata and subterranean reservoirs are thus causing a greater draft on these reservoirs to compensate for the loss of the filtered waters once gradually released from a well clothed watershed . . .

Any permanency in California's agriculture must be based on watershed health and control."

### Forests and Fire

In the face of greatly expanded use, still struggling with abbreviated appropriations, the Federal Forest Service was leaving no stone unturned to continue its multiple use practices of protection and management of the great watersheds. Similarly, the State forestry organization or its counterpart local forestry agencies in some counties, was battling the fire menace in the valleys and foothill areas. So closely interwoven are the farmlands, the foothills and the higher mountain slopes of California, that uncontrolled fire in the farmers' fields - and in some localities even in urban areas constitutes a direct threat to the watersheds lying at higher elevations.

Any history of the California Region of the United States Forest Service is essentially a story of California rural land use and no chronicle of land use and management of the State could be complete without an account of the work of this Federal agency occupying a place in the picture. History shows that this versatile organization has operated oblivious to political influence and objectives, its aim being to constantly carry out the principles laid down by the Theodore Roosevelt, Woodrow Wilson, and Clifford Pinchot, those of the greatest good to the greatest number of people for all time, and use without abuse of the lands placed under its charge.

In 1930 the gross area actually included within the boundaries of the national forests of the State was 24,144,950 acres, of which 4,928,618 were private land and 19,216,332 acres publicly-owned. In addition to the Government lands under their charge, the Forest Service was entrusted with the protection of several million acres of the adjacent private lands thru cooperative agreements with their owners, as the role of fire on California lands was gradually accorded the fearsome respect which was its just due.

The forest ranger - the man next the people - was little different from his predecessor of a quarter of a century previously in spite of the fact that candidates for the position were now



required to have a college degree in forestry. His status continued very much to be that of a respected community leader, even with the lessening isolation of the mountain valleys which are such a component part of California's rural life. Often in his zeal, he almost forgot that he was a government employee, as he jealously nursed and tended the empire of land placed under his direct charge.

Sometimes the forest officers were more farseeing than their superiors, or the lawmakers at Washington, and championed a course of action reflecting the feelings of the citizens of their community, perhaps not strictly in accordance with latest nationwide policies. This attitude was often - perhaps justly - characterized as "provincial" by distant Washington executives. Always the forest ranger was the "soothing syrup" when modern trends brought about changing practices under his basic code of the greatest good to the greatest number policy, and such were opposed by the permittees and users of his mountain domain.

In many localities, ~~particularly~~ in the southern section of the State, the protective brush and tree cover of the watersheds extended down to the citrus groves and to the very edge of the most intensively used farm lands of the nation. In the mountain and foothill counties, the problem of the lumberman and livestock producer and the miner were the problems of the Federal Forester as well. The richest agricultural counties of the State also included within their political boundaries extensive areas of the nation's forests.

With a rainless season of four to eight months in the twelve, during which climatic conditions were ever-ready for the careless or accidental spark, combined with the pressure of population, the fire problems of the farmer and the mountain guardian were very much akin. More stringent fire laws and regulations, Federal, State and County, marked California's growing recognition of the intensity of her rural fire problem.

Besides the Federal and State regulations, each county passed fire prevention ordinances carrying severe penalties for carelessness with fire in rural areas. To rouse the often apathetic public fire consciousness, particularly among the tremendous number of out of State tourists as well as new settlers yet ignorant of the local fire menace, the press, the pulpit, tourist agencies and scores of private conservation organizations conducted fire prevention campaigns.

Commercial enterprises, such as the large gasoline-selling concerns, devoted their efforts to cautioning the public of the need for greater care with fire. Conservation of natural resources



and fire prevention were included in the school textbooks and became part of the regular educational curriculum; yet, as one of the natural results of increased land use, the fire hazard in California grew year by year.

Fires started by careless smokers alone continued to cost taxpayers millions of dollars annually. Lightning fires, which took a heavy toll of the State's timberlands, played second fiddle to those started by human agency due to the fact that forest guardians generally knew about where they would start - and when. The man-caused fire was liable to break out any time, anywhere, with the responsible party often many miles away and blissfully ignorant, perhaps, of the ravaging fire left in his wake.

In many parts of the State, open camp fires were banned entirely. The well-patrolled national parks, with relatively more man-power available and a more restrictive form of use, had in general, a much less flashy type of vegetative cover than the other wild land areas, but their guardians also tightened up materially on fire prevention regulations. The Forest Service, with the increasing volume of recreational use of their lands, came to require a special camp fire permit even if the campers were to use only specially-constructed camp stoves or gasoline-burning cooking apparatus. The Federal Forest Service also first prohibited its own employees from smoking in the woods during the active fire season and later this prohibition was extended to include the general public as well.

In 1927, under Forest Service edict, such automobile or horse pack train using the national forests were required to be equipped with a shovel and axe suitable for fire-fighting use. A branch of Information and Education which produced and showed action films depicting actual ravages of fire and following flood disasters, directed preparation and distribution of warning posters and literature, headed up State-wide fire prevention campaigns and handled publicity generally, became an important unit of Forest Service management. During periods of exceptionally high fire hazard, entire national forests, or sections thereof, were closed entirely to recreational use such as hunting, fishing and camping.

Just as population increase in the urban areas spells increased fire hazard, so does increased human use of rural lands mean the same thing. While there was no material increase in Federal fire protection personnel during the twenties, the force of the State Division of Forestry was considerably augmented. From a fire-fighting force in name only, in 1922 the organization was increased to include twenty-one rangers, two inspectors, two lookouts and two men on special fire hazard reduction work. In 1927, ten additional rangers were added to the State force and







counties cooperating in fire control work increased in number from twelve to twenty-one. M.B. Pratt, a former Federal forester, was now the administrative head of the State forestry organization, a position which he held up to his retirement in the late summer of 1944. Pratt died a few months after retiring from active duty.

In 1927 also, State interest in forestry matters was greatly stimulated when former Governor George C. Pardee was again appointed chairman of the State Board of Forestry and that year the State received \$30,000 Federal funds under the Clark-McNary Act. It was in 1927, too, that a disastrous fire, sweeping thru grain fields and range lands of the Sacramento Valley, roused the legislature to greatly increase appropriations for the State's forestry body and led to the adoption of modern motorized fire-fighting equipment.

Altho La Tour state forest of 10,000 acres was established at this time in Lassen county, supervision of State parks was removed from the forestry organization and turned over to the newly created Division of State Parks. The State Division of Forestry now became first and foremost a rural fire-fighting organization.

Some counties preferred to maintain their own forestry administration, while at the same time securing from the State their share of allocated cooperative Clarke-McNary Act funds. Such notable exceptions were Los Angeles, Ventura and Santa Barbara counties, each with an official county forester or county fire-warden and a regular forestry and fire-fighting force. Organized on a rather comprehensive basis, the forestry department of intensively-used, heavily populated Los Angeles county was quite comparable in size of force and magnitude of operation to the State organization itself. Charged with the administration of county parks and other conservation activities, the main role of this organization was rural fire protection. In 1929-30 its annual appropriation was almost a million dollars and altho this figure dropped to almost half of that amount in succeeding depression years, records show that it handled in 1932 a total of 344 fires, exclusive of blazes which efforts of its personnel confined to structures.

The functions of organized fire prevention and fire suppression in California, outside of incorporated cities and towns, was similar to the present time in that the State organization or county fire and forestry department were responsible for the protection of the lower-lying territory and foothill area up to where the Federal forest service assumed responsibility for the higher-lying public lands and the adjacent or component area in



private ownership. As previously asserted, fires on the unreserved public domain were a sort of loose responsibility. The Federal Forest Service lent its services and equipment freely for combatting fire in the national parks and on areas administered by other Federal agencies.

The forest fire season of 1924 was one of the worst which ever hit the Western United States. Lightning struck frequently and hard all over the mountain area, with little moisture accompanying the storms. These dry electric storms were highly concentrated and frequently started scores of fires all at once within a limited scope of territory. Week after week in the California mountains there was no cessation in the climatic combination of dry, searing winds, high temperatures and low humidity which ever produces a fire hazard condition in California known as "explosive." Too, there was always the careless smoker, the thoughtless motorist and the ignorant land user to provide the spark which added many man-caused fires to those of natural origin.

Week after week red-eyed forest rangers led weary fire-fighters from one blaze to the other, as the smoke-filled California skies became reminiscent of conditions so common four or five decades previously. The Forest Service broadcast appealed to land users of all classes and the press of the State united in warning and cautioning the public. Most of the national forests of California during this critical period were closed to all forms of use except that necessary for the prosecution of the livestock, grazing, mining, lumbering and related ventures carried on therein.

The net result of the 1924 forest fire season in the national forests of California was an occurrence of 1,932 fires which burned over 762,000 acres and resulted in a fire damage loss of \$1,251,000. Altho some few lives were lost, it is to the credit of these Federal forest fire-fighters that this loss approached nothing like the tragic death toll taken by the Idaho forest fires of 1910 - a season very comparable with that of 1924 throughout the forests of the Western states.

The average annual total number of fires on both government and private land within the national forests of California for the years 1920 to 1923, inclusive, was 1,233, of which 977, or 80 percent, were brought under control before reaching ten acres in size. An annual average of 795 of these fires, or 65 percent, were caused by human agency, the balance being started by lightning. Of both government and private land within national forest boundaries, an average area of 179,528 acres was burned over annually during these four years. Sometimes figures of area burned do not mean too much since forest fire-fighting strategy involves preventing as much as possible the burning over of valuable timberlands or important watershed protection cover, at the sacrifice of lands having a lower forestry or watershed value.





In March 1926 S.B. Show, California-reared, was selected by official Washington to succeed Paul G. Redington as Regional Forester in charge of the national forests of the California Region on the latter's assignment to the office of Chief of the Bureau of Biological Survey.

Show had the advantage of being backed by years of experience and as the leader of the forest supervisors and rangers with whom he had so long worked one of his first steps was the practical application of known scientific principles of land use in an endeavor to reduce the forest fire losses resultant from California's unique fire hazard.

The California Forest and Range Experiment Station came into existence on July 1, 1926. With headquarters on the State's university grounds at Berkeley and fairly well endowed with supplementary cooperative funds advanced by individual conservationists and organizations, it was established in the phraseology used, "To determine the best methods for conservative management of forest and forest lands and the protection of timber and other forest products; to conduct silvicultural, dendrological, forest fire, economic and other experiments." E. I. Kotok, another California forest executive and one with a decided analytical bent, became the first director and remained in charge until 1942 when, called to Washington as assistant Chief of the Forest Service, the direction of the official experiment station was placed in the hands of J. Albert Hall.

These two newly-appointed forest executives were essentially men of California's soil. Working for years amid the changing complexity of California land use, they were impregnated with its problems, particularly those relating to forestry and fire. International interest was aroused in the graphic analysis presented in treatises jointly authored by Show and Kotok in the years 1920, 1924, 1925, 1929 and 1930. These government publications, while quite understandable by the layman, included technical details of fire prevention, fire suppression, analysis of defects in methods practiced and systematic fire plans. Such plans were developed by a detailed analysis of discovery time, travel time necessary to reach fires in the hinterlands, amount of man-power needed in different localities under differing conditions, and other factors involved in preventing and battling that leading arch enemy of California land use, the uncoltrolled fire.

New techniques in fire fighting developed. The more general use of water thru the medium of pump-equipped tank trucks, started on a small scale in 1921, was greatly increased in 1927 and succeeding and at times replacing the time-honored hand work of shovel and axe, came into vogue. Hazard surveys started in real earnest





in 1925 and removal and reduction of intensity of such fire hazards in the mountains as old buildings, dry vegetative growth along roads, trails and highways and accumulated debris around mining and similar operations, was undertaken.

The forest rangers prevailed on private owners to clear areas around their residences and buildings of inflammable grass and weeds, just as the primitive people of the State had done centuries previously, to protect their rude haciendas. As a part of the conditions of their special use permits, the thousands of permittees having summer homes in the national forests were required to keep their premises cleared of inflammable growth, cover their cabins or more pretentious residences with fire-resistant roofing, and install special spark arresting flues. Power companies and railroads were prevailed upon to exceed previous efforts in fireproofing their rights of way.

Fire lines were constructed around the more heavily-used public camps by the Forest Service personnel themselves. As a forerunner of a later more elaborate type, a special camp ground stove was developed by L. A. Barrett, assistant regional forester of the California Region, from worn-out ice cans. These heavy metal containers, discarded in the thousands by ice manufacturers throughout the State as soon as they become leaky, were picked up for little or nothing and for a few cents each converted by the forest rangers into a very practical, roomy camp stove and more important—a safe one. Incidentally, the Federal foresters flew in the face of tradition by making the flue pipe on these cheap stoves square, instead of round, to fit the purpose better and telescoped, to lend themselves to easier and more economical mountain transportation.

As a further fire prevention measure, the tempo of enforcement of Federal, State and local fire laws was greatly increased and a considerable sum of money was deposited annually in State and municipal coffers as local, State and Federal officers brought thousands of fire law violators, mainly careless smokers, to book before local justices. And these rural justices, themselves invariably small land owners and intimately acquainted with the magnitude of the rural fire menace, sometimes erred on the side of harshness in meting out legal punishment. Time and again the constitutionality of fire and conservation laws were made the subject of test cases originating in these rural courts and, time and again their legality was upheld by the higher tribunals.

Considering the ever-increasing greater risk, progress was actually being made in the rural fire problem. The average number of man-caused fires occurring annually on public and privately-owned lands within California's national forests for the years



1925 to 1929, inclusive, was 924, besides several hundred each year starting from natural causes. Only nineteen percent of these fires reached an area of ten acres or more before being brought under control, and the average annual area burned was 187,012 acres.

We find in 1931 a total of 1,134 individual fires occurring on public and private lands within California's national forests but only 170 of these, or 15 percent, reached a size of ten acres or more. The total area of such lands burned over that year had dropped to 140,086 acres. The following year's record shows a total of 1,295 similar fires, 140 of which, or slightly more than ten percent, covering ten acres or more. The total area burned over in 1932 was 290,982 acres, approximately 220,000 acres of which, resulted from one large fire - the Matilija - which burned in heavy watershed cover and timber in Ventura and Santa Barbara counties, within Los Padres National Forest.

This fire, the result of carelessness on the part of some unknown camper or deer hunter, started on September 7, 1932 and well illustrates the extreme summertime fire hazard represented by the dry, vegetative cover of the California hills. The fastest-burning wild land fire in the West recorded by history up to that time, it literally exploded on the landscape and covered almost 20,000 acres within a few hours of its start, burning over from 10,000 to 30,000 acres daily for the following ten days. It was brought under control the fourteenth day by the efforts of thousands of local volunteer and drafted fire-fighters, led by Federal and State officers from all parts of California, and from neighboring states as well, including also the considerable fire-fighting forces of Santa Barbara and Ventura counties.

Forest Supervisor S. A. Nash-Boulden, veteran fire-fighter, who was in charge of the fire from start to finish, included the following statement in his official report on the conflagration:

"I believe it safe to say that no fire in California has ever before made such a rapid and continuous burn ... The rapid runs made by the fire were of such intensity that fire-fighters on a greater part of the fire line were in constant danger. Within an hour's time on September 10th the fire travelled a distance of fifteen miles."

Fire-fighting experts from different parts of the nation praised the well-organized efficiency which characterized the handling of this fire, burning in almost impossibly rugged terrain - a tribute to years of pre-organization and planning. The fire lines which



finally checked the progress of the flames were between 400 and 450 miles in length. Considering the magnitude of the task, the cost of final control of the fire was quite nominal, a grand total of \$107,000.

While hundreds of deer alone among the wild life of the region were trapped, some domestic stock perished in the flames and scores of fire-fighters were injured, no human lives were lost on this, the largest forest fire California has ever known. Altho no word of such appears in the official records, stories are yet extant in nearby communities of the heroism and coolheaded action of the officers in charge in leading apparently doomed groups of fire-fighters to places of safety.

The depression years of 1929 to 1932 intensified the rural fire problem in California because of the large number of itinerant unemployed roaming the country. This was somewhat counter-balanced, however, by the fact that plenty of fire-fighting labor was readily available in the form of laborers everywhere willing to exchange their services for a few honest dollars. Both the Federal and State forestry organizations turned this circumstance to further good account by building up mobile, quick-moving fire suppression crews, located at strategic points. The men employed on these crews were paid only a small cash wage but were well fed and comfortably lodged under sanitary conditions in tent camps or makeshift buildings.

A word in conclusion on the 1932 California forest fire picture in the mountain region of California. Under the hazardous burning conditions prevalent, that fires were prevented, or that after starting were stopped at all, could easily excite wonder. The entire fire organization of rangers and guards - the latter employed during the active fire season months - and omitting such special crews as those mentioned above, divided into the area under protection, gave each man an average of some 25,000-odd acres to protect. On level ground, well criss-crossed with roads, a trained, ambitious man might do fairly well on such an assignment. It must be remembered, however, that this area represented rugged terrain, covered with tangled brush fields and timber growth, much of which taxed a man afoot or on horseback to navigate at all. On the intensively-used town forest lands of the Atlantic seaboard states where the fire risk is not in any way comparable to that of California, the handling of a thousand acres or less by one man is considered a full time chore. An anomalous factor in this California wild land use situation was that except during extremely critical fire hazard periods practically all the area was open to free and unrestricted public use.







## Outdoor Recreation

The public use of mountain lands in California was increasing by leaps and bounds. The national parks of California registered 146,240 visitors in 1921, some 290,200 in 1925 and 643,089 in 1930. In 1931 almost half a million tourists visited the Yosemite National Park alone. In 1922, recreational visitors to the national forests of the State were estimated to number one and one-half million; in 1925 the forest rangers reported an estimated two million, and in 1930 this number had grown to almost four million, exclusive of thru highway travel which took some thirteen and a half million more people over some one or another of these national forest areas. As a forerunner of the still greater volume of tourist traffic to follow, one public service agency estimated that during the depression year of 1932, 840,000 transient visitors to Southern California alone spent \$119,200,000 in that section. Government agencies dealing with the administration of the State's wild lands were having their hands full in handling the hordes of visitors seeking recreational use of such areas.

In 1923, out of a grand total of 7,536 special use permits of national forest lands, 3,881 were for summer homes; in 1927 special use permits for these lands numbered 9,195, of which 5,448 covered summer home sites; by 1932 the volume of summer home sites leased by the Forest Service in California had reached a figure of 6,821 out of a total of 11,214 special use permits involving land uses ranging from fur farms to dude ranch pastures.

Beside the immense investments made by private enterprise, public campground construction steadily progressed in the national parks and national forests. Even in the highest Sierra Nevadas, the Park Service established overnight tourist camps for hikers some ten miles apart, to cater to the needs of these hardier recreationists. Private construction under special use permit in the national parks ran towards palatial hotels costing huge sums of money, built to cater to tourists who preferred and could afford to enjoy the beauties of nature without any sacrifice of the luxuries offered by the most ultramodern urban hostelryes.

The tourist business in California was fast becoming a leading industry as road and highway construction provided access to all corners of the State. By 1932 the State highway system embraced 7,388 miles - this exclusive of county roads and highway systems and roads built and maintained by Federal land administration agencies. And in spite of the increasing use of the auto, that same year California's railroad mileage was 8,300, with new construction still under way.



## Wild Life and Fish

The wild life management problem grew in intensity and it might be said that up until well along in the 1920's fish and game protective laws were still in the horse and buggy stage.

In 1925, the State sold a total of 222,983 angling licenses; in 1930, the number had increased to 248,319. Hunting licenses sold in 1925 totalled 226,421, and in spite of prevailing unfavorable financial conditions, 231,970 in 1930.

The State Division of Fish and Game during this period credited California with 26,912 miles of fishing streams and planting of trout and salmon fry by this State organization, in cooperation with Federal agencies and sportsmen's organizations, had reached an enormous volume. In 1928 the State was operating eighteen fish hatcheries and twenty egg-collecting stations.

Deer hunting continued to hold its place with fishing as a popular outdoor sport, California hunters killing around 15,000 deer in 1925. In 1927, the total deer kill was 19,500; in 1930 it had grown to 24,132, and in 1931 the bag was 25,805.

The Federal forest rangers estimated a total deer population within and adjacent to California's national forests to be 59,800 in 1921, but in 1925 their estimates-conceded by wild life authorities to be quite conservative - gave the total as 237,000 and in 1929 as 254,000. The number of black and brown bear that year was placed at 11,400, the last living member of the great, dangerous grizzly bear tribe having been killed in Tulare county in 1922.

The rangers and State game wardens in 1929 credited California with having 900 prong-horned antelope, an animal which had been just about extinct in 1915, but was now thru legal protection increasing in numbers. The antelope herd at Mt. Dome in Siskiyou county, which numbered but 15 in 1915, in spite of the heavy toll taken of their numbers during a couple of hard winters, had increased to 500 in 1930.

The State was gradually making progress in wild life conservation, while still giving the hunter and fisherman a fair share of sport. In 1927, redistricting of the State imposed a one-buck limit on the big Rocky-Mountain mule deer ranging in the northeast portion. To bring in revenue for extension of fish and game propagation and protection, the price of hunting and angling licenses was doubled. Bag limits were reduced on upland and shore birds and the length of the shooting season on different species of game reduced or suspended entirely for a term of years. As a restraint on the so-called "game hog" the tag system of recording deer bagged was adopted.



Large official game farms were established by the State in the latter twenties at Yountville in Napa county and at Chino in San Barnardino county, for the propagation of upland birds. Preserves covering the resting places of migratory shore birds were established. The one lone, migratory bird sanctuary ( established at Lake Merritt in Oakland away back in 1869, had grown by 1922 to a total of 28 game reserves, making a total area included in Federal and State game and bird refuges of almost two million acres. By 1930, including national parks and monuments, some three and a half million acres of wild lands provided a sanctuary for the State's wild game bird and animal population.

That any measure of protection accorded to California's largest game animal was a paying proposition is evidenced by the aftermath of the serious epidemic of foot and mouth disease which swept rural California in 1924 and 1925, during which time thousands of head of domestic livestock were slaughtered, and controlling agencies found that the sacrifice of large numbers of wild deer was also necessary to check the spread of the infection.

Thousands of deer were shot all over California by hired hunters and game wardens. In the Stanislaus National Forest alone, the approximate center of the outbreak in the State, over twenty thousand deer were killed. Only a few years later, however, deer again were fairly abundant in that area and the same held true throughout other deer ranges of the State where control operations were carried on. Local nimrods, who had been mourning the passing of California's deer herds, were surprised at the rapidity with which the best deer hunting areas restocked.

California's approximate 1200 miles of coast line extends thru ten degrees of latitude and these coast waters, with their varying conditions provide sea food in abundance. To enjoy sport fishing off the California coast, sportsmen from all parts of the nation and from foreign lands as well made annual pilgrimages, particularly to the southern section and the San Francisco Bay region.

Record catches in California coastal waters included a 573-pound broadbill swordfish, a 493-pound giant bass, a 198-pound tuna, a 393-pound marlin swordfish, a 60-pound yellow-tail, a white sea bass of the same weight, and a 65-pound albacore. Sportsmen mixed with commercial fishermen in chasing schools of yellow-tail and tuna some miles out from the seacoast, and thousands of fishermen enjoyed the sport of fishing for other species from barges or other small craft only a few rods off the shoreline. Millions of dollars were invested in recreational coast fishing.







Profits from commercial fishing presented almost staggering figures. According to the State Division of Fish and Game which handled the administration of the commercial fishing industry in cooperation with the U.S. Bureau of Fisheries, total fish landings at four California ports for the months of April, May and June, 1932 were 22,988,667 pounds, exclusive of any fish brought in from Mexican waters. The heaviest catches included 3,200,000 pounds of Pacific mackerel; 1,600,000 pounds of sardines; 3,500,000 of squid, and 2,500,000 pounds of sole. During these three months, catches of shad, barracuda, rockfish and abalone ran well over a million pounds each. These commercial fish harvests represented over fifty different varieties of fish, three species of crustaceans and ten species of mollusk.

### Other Conservation Activities

Besides the somewhat dilatory attention being paid to wild life protection, other conservation moves and activities greatly motivated California's progress during the 1921-32 period. The previously-mentioned Clarke-McNary Act, becoming law in 1924 and amplified in 1926, opened an avenue whereby State funds expended for the protection of timbered and forest-producing lands from fire, particularly from a watershed protection standpoint, would be matched dollar for dollar by Federal appropriations. The McNary-Sweeney Act, enacted in 1928, provided for forest research and technical investigations of forest tree diseases, forest insects and forest wild life and provided for the maintenance of the California Forest and Range Experiment Station, also previously mentioned as becoming a leading factor in pointing the way to better land use practices.

To the Weeks Law which provided for public acquisition of forest lands, there was added the Land Exchange Act of March 20, 1922. Private timberland owners generally had no further use for their land after it had been stripped of its commercial tree growth. The Forest Service, on behalf of the citizen proprietors, could take over these cut-over lands and administer them with resultant profit to the public purse some decades later. There were also areas of land in private ownership which had a much greater value for public use and isolated tracts of either public or private lands which could be consolidated for more efficient public administration or better economical use by the private proprietors.

The land Exchange Act was a cold-blooded business affair with the underlying principle that any exchange made must show some "advantages to the Government", even if it was only to simplify administration. It provided for either exchange of land for land or for the exchange of standing timber with the private owner for his practically discarded cut-over lands. It was good business for both the private owners and the government.



Sometimes the exchange was a tri-partite one, by which the money paid by some lumber concern for government stumpage was used to purchase cut-over or other land from an owner perhaps located in another section of the State entirely. In 1925 this law was very sensibly amended to allow the Secretary of Agriculture to appraise and accept title to exchanged lands within national forests rather than going thru the complicated inter-departmental process of having the Secretary of the Interior, general custodian of public lands, take this action. By 1930, a good start in this work had been made by the Forest Service, 15,297 acres having been acquired by that date.

In the redwood belt good progress was being made by the "Save The Redwoods League" in getting some part of the redwood forests back into public ownership. One citizen of Massachusetts purchased and donated a grove of 113 acres of magnificent redwoods to the State of California. George F. Schwartz, former forest ranger, furnished most of the funds for the purchase of a grove of 157 acres containing a stand of twelve million feet of timber, as a monument to the former chief of the Forest Service, Henry S. Graves. In 1924 the supervisors of Humboldt county voted \$25,000 towards the purchase of the Bull Creek Flat grove of redwood timber, said to be the heaviest stand of timber in existence anywhere in the world.

In 1918, California did not own a single tree in the main redwood region. By 1928 the "Save The Redwoods League", with its 7,000 contributing members, had purchased and returned to public ownership close to a million dollars worth of redwood groves. Up to that year, 14,221 acres had been acquired for public use, 12,522 acres of which were included in State parks, the balance in city and county parks, or held for public use by various public service and fraternal organizations. The League had also been chiefly instrumental in having had preserved for public use fifteen miles of redwood groves along the now famous Redwood State Highway, one of the most unusual scenic routes in the world.

John D. Rockefeller Jr., alone, donated one million dollars for the acquisition of redwood groves for public use. By 1931, a total of 24,622 acres were included in public ownership, one purchase that year involving 13,000 acres at a cost of \$3,500,000. A large part of the acquired area was included in State parks since the State was now seeking to get back some portion of the lands given away for a mere song in the previous century.

A twelve-million dollar State Park purchase plan had been upheld by the voters in 1928, to include in addition to redwoods, acquisition of shoreline lands for public beaches. It had been found on checking up that beach lands had been given away with the same lavish hand as had the redwood groves, since in 1928 out of 850 miles of usable beaches but 35 miles remained in public ownership.





In spite of the growing conviction in the minds of public-spirited citizens that exploitation and monopolization of public lands must cease in California, it was not at all clear sailing for conservationists and exponents of the policy of public ownership of lands and natural resources. In 1921, Secretary of the Interior, Albert E. Fall, attempted to have the national forests transferred from the Department of Agriculture back to the jurisdiction of his own department and openly declared that government land resources ought to be distributed in private ownership where, he asserted, they would be of greater use to the country.

For several years thereafter considerable dissatisfaction was expressed in several quarters with the policy of restricted grazing of livestock on the national forests. In the spring of 1925, a close investigation was made of Forest Service activities and land administration by a Senate committee, not too friendly disposed towards the Forest Service. This investigation undoubtedly had something to do with Western land grazing bills introduced in Congress the following year which would have in effect given permanent grants of range lands to individual stockmen. These bills, however, were opposed by both the Secretary of Agriculture and the new Secretary of the Interior and failed of passage.

As a sort of counterblast, perhaps, to the assertions of exponents of private ownership of wild lands, land use experts of the Department of Agriculture, making a joint study of forest and agricultural land use, in 1930 called attention to ownership of forest lands in other countries in comparison with that of the United States. While in our own country less than twenty-five percent of the forest lands were in public ownership, their figures showed publicly-owned forests in Canada represented 90 percent of the total; in Australia and New Zealand, 75 percent; in Germany, Japan, Italy and Rumania, 50 percent; in Finland, about 45 percent; and in France and Poland, approximately 35 percent.

### Parks vs. Public Forests

Every so often thru the years, attempts have been made to transfer the Bureau of the Forest Service back to the jurisdiction of the Department of the Interior under which in previous times, its administration had been such an evident failure. With the ever-increasing volume of tourist travel in the mountains and the growing use of the national parks, the Bureau of the National Park Service, an Interior Department agency, greatly expanded. Frequently exponents of the Park Service concepts of land use sought further expansion of the national parks by casting longing eyes on adjacent areas of mountain lands included within the national forests.





While harmonious relations existed on the ground between the local officers of both agencies - the Park Service, engaged in managing lands under the principle of preservation, and the Forest Service managing a somewhat similar type of lands under the conservation-multiple use policy, - there was constantly recurring wire pulling at Washington to augment the national park areas at the expense of the national forests. Land users, depending upon mountain lands for their economic well being were in constant fear of these moves, which if consummated, would tend to lock up the natural resources of the wild lands to all forms of profitable use.

It will be remembered that the basic principle back of the establishment of national parks-and national monuments also-was the fact that the areas set aside, or reserved, were of such outstanding natural or historic value that there could be little or no argument against the need of their preservation in exactly the same condition as such areas, with their geological features, flora, fauna and historic landmarks, originally existed. Exponents of the Park Service theory of land use were constantly looking for smaller fish to fry, however, and in some localities of the State where conservative commercial use was firmly entrenched and carried on as part of the multiple land use policy of the Forest Service, considerable bitterness developed as "preservationists" took issue with "conservationists."

In national parks an admission fee was charged all visitors, a practice undoubtedly justified in view of what these publicly-owned areas had to offer; recreational use of the national forests was free. Hunting was banned in the national parks, as was the grazing of livestock and cutting of timber. These activities were subjects of restricted use on the national forests, either free or at a price commensurate with the commercial value of the use concerned. Irrigation and hydro-electric development, allowed and encouraged on the national forests, meant man-made structures strictly at variance with Park Service regulations. Any taint of commercial use of land, in fact, was contrary to the aesthetic-minded Park Service administrators. Many of the rank and file of national park visitors, however, though they did have somewhat of a charge of commercialism to bring against the National Park Service.

There was so much to see of the glories of nature in the national parks that visitors usually had to make a sufficiently long stay to require food, lodging and sometimes special transportation accommodations. Such were available at the palatial hostclries maintained by private interests under concessions from the Park Service. The prices charged by concessionaires for such accommodations were high and often somewhat beyond the means of ordinary citizens. Plain John Doe could maintain his family in comfort



for a week on the prices charged for a single day's meals and lodging at one of these luxurious national park hostelryes.

Undoubtedly, the shortness of the tourist season to some extent justified these high prices but the average tourist-artisan, farmer, and small business or professional man, could not quite see this factor, especially in view of the fact that he was ordinarily not seeking deluxe accommodations amid these scenes of natural wonder and beauty. Unless he had special camping equipment and food of his own, he had no recourse except to leave, or pay the prices exacted.

At times, there was no place else he could turn since in some cases national park concessions were patterned on a rather monopolistic basis such as in the case of the Sequoia and General Grant National Parks Company, which held the exclusive rights of catering to the public within those wonderful public playgrounds. It was perhaps quite natural that a conviction built up in the minds of a considerable portion of the touring public that national parks were recreation areas maintained mainly for the rich and not for the man on the street.

There was even a marked difference between the forest ranger and the park ranger. The first, as heretofore pointed out, was part and parcel of the community in which he lived, vitally interested in its problem and its people while the latter, valuable public servant tho he was in his own domain, had little in common with the transient thousands whom he served.

### Grazing

An approximate total of about half the lands in the national forests of California were usable for grazing during the years of 1921 to 1932. Some were too heavily stocked with timber growth to produce much forage, some large areas were waterless, other sections much too rugged, and on many thousands of acres of brush and minor tree-covered watersheds the vegetative cover was too dense for grazing use. An approximate annual average of ten and one-half million acres was available for profitable livestock pasturage. This use fluctuated somewhat with the condition of the markets and the status of the livestock industry in general.

In 1921, the national forest ranges, still suffering somewhat from wartime overstocking, provided pasturage for 211,500 head of cattle and horses, and 567,000 head of sheep and goats. In 1925 this figure had dropped to 169,700 cattle and horses and 426,000 sheep and in 1932 to 147,000 cattle and horses and 382,700 sheep. Small independent stockmen continued to form the bulk of the grazing permittees on the national forests. In 1929, out of a



total of 1824 cattle permittees, almost fifty percent grazed one to forty head each; approximately twenty-six percent grazed 41 to 100 head each; fifteen percent ranged 101 to 200 head each, and nine percent over 200 head each.

### Timber

During the twenties, until near the end of the decade when the pinch of the national depression began to be felt, the lumbering business in California maintained a fairly steady stride. The pine timbered belt from approximately the Truckee Pass north was all set for a big timber boom when the depression years came.

The Red River Lumber Company, one of the largest timberland owners in California built its immense plant and its own town of Westwood in Lassen County, a section where extensive logging operations were also carried on by other large lumbering concerns.

His timberlands in Texas cut out, W. A. Pickering, head of the Pickering Lumber Company, already operating on a large scale in the central Sierra Nevadas, commenced development to cut over some 350,000 acres of the company's holdings in Modoc county, to be supplemented by purchase of adjacent government stumpage.

Pickering planned conservative utilization of his timberlands and permanent community prosperity in the community of Alturas where he built a million and a half-dollar sawmill plant and constructed the largest artificial mill pond in the world. This plant never turned a wheel since the sudden death of the lumber magnate in 1929, coupled with the dawning economic depression, brought activities to an abrupt halt. In preparation for the seemingly assured prosperity of that region three through railroad lines were built across northeastern California lands to Oregon connections, somewhat surfeiting with rail transportation a large section of the State formerly much isolated in this respect.

California's total cut of lumber in 1921 was 1,350,000,000 board feet, the output of 204 large and small concerns. In 1923 lumber production rose to 2,118,000,000 board feet having a value of \$86,959,000, an all-time high not to be again reached until the years of the second World War. In 1923 also, 206 establishments were engaged in sawing trees into lumber and a total of \$38,240,000 was paid to 24,772 wage earners engaged in the industry.

Altho the number of sawmill plants declined greatly due to the small lumberman being unable to compete with the large operator, the high volume of lumber output continued till 1929. In 1931 the annual lumber production had dropped to 960,000,000 board feet, the number of operating plants to 115 and the number of wage







earners to 11,269. The value of production that year had toboganned to slightly over twenty-eight million dollars and the lumbermen's payroll to \$13,747,000. During the period 1920 to 1929, lumber was being produced to a greater or lesser extent in 43 of the 59 counties of the State.

Redwood lumber production maintained a fairly consistent level, the peak production of 490 million board feet having dropped only to 400 million feet in 1930 when the annual cut of the softer woods of the pine region had fallen to such a low figure.

The prosperous year of 1925 affords a fair illustration of the relative amounts of lumber manufactured from California's different native tree species, the following figures being expressed in terms of the nearest million board feet. Besides redwood, there was produced that year 206 million board feet of lumber from Douglas fir; 26 million from incense cedar; 299 million from sugar pine; 226 million from white fir, and from the State's leading lumber tree, ponderosa pine, an annual cut of 777 million board feet. Of the total lumber production of more than two billion board feet, 351 million board feet of various other species made up the balance.

Many large and small lumbering concerns now operated exclusively in national forest timber and most of the other cut stumpage in part on these public lands. The bulk of the timber cut from the national forests was represented by ponderosa pine and sugar pine, in forestry and lumbering circles the Jeffrey pine being lumped together with the ponderosa. For the benefit of lumber trade identity this latter tree had boasted three different names in its California environment during a few years. First called yellow pine, the name was changed to Western yellow pine to differentiate it from the yellow pine of the Southern states, and later to its present nomenclature.

For the California pines, lumbermen paid \$2.25 to \$4.50 per thousand board feet for the timber as it existed in the growing tree. Individual counties within which national forests were located, greatly profited from the sales of government stumpage with the return to their treasuries for the benefit of roads and schools of twenty-five percent of the gross receipts.

In addition to the timber cut by commercial operators, farmers secured from the national forests fence posts, firewood, poles and similar products for home use, either on a free basis or at a special cost rate, to the amount of some fifteen million board feet annually. Since the annual wood use of the individual farmer and settler averaged around five thousand board feet, or less, a great many rural dwellers benefited by this special concession, which could be taken advantage of only by nearby farmers who must use the products on their own farms.



Besides free use timber granted to farmers and settlers, the total timber cut on California's national forests for the period 1921 to 1925 was 1,078,658,000 board feet. For the period 1926 to 1930 the total cut was 1,732,231,000 board feet. When handled on a commercial basis, special forest products such as turpentine, bark, cones and Christmas trees also augmented the profits from the publicly-managed forests. Small amounts of such products, if secured by the users themselves, were granted free of charge.

With the spread of the practice of applied forestry throughout the nation, foresters and lumbermen more and more began seeing eye to eye in the matter of needed conservation practices. The lumberman of this year was sometimes the forester of next, or vice versa. The lumberman could still carry on "timber mining" on his own lands but not on the adjacent public forests, so with the evidence of conservative use and management of timberlands before their eyes there began to grow up among lumbermen a respect for the foresters' theories, a fact which can be readily noted in the lumber trade journals of the period. The larger Pacific Coast lumbermen adopted the policy of employing technical foresters as part of their regular personnel to work out plans for timberland management, utilization, sustained yields and reforestation practices.

Gasoline had revolutionized logging methods and logging and lumber manufacturing machinery development kept pace with kindred development in agriculture and urban industries. Laboring oxen and horses were used only in the smallest and most isolated logging operations, the former only on more or less of a novelty basis. As electric transmission lines pushed further afield, electric donkeys replaced the long used, steam-operated donkey engines.

By 1925 all the larger lumber companies were using gasoline-propelled equipment in the woods and by 1927 such large lumbering concerns as the Pickering, Diamond Match, Sugar Pine and Yosemite Lumber Companies were using caterpillar tractors on terrain formerly considered accessible only for donkey engine logging. By 1930 the new type of hydraulic lift, tractor-drawn logging wheels were being used by the Red River Lumber Company and some of the other large concerns to assemble logs at transportation points.

Lumbering in California had become even more of a science than agriculture. Better lumber grading practices and closer utilization marked the progress of the industry. Tractor logging left logged-off private lands in quite a sorry mess but foresters were somewhat cheered that concessions were more and more being made to this factor in the designing of logging equipment. The slashings and debris left behind in operations on private lands were





often cleared by cooperative efforts of private concerns and the Forest Service where adjacent public lands were involved, but in the interim their existence as a ground covering constituted an alarming fire menace.

Following the devastating fires of the season of 1924, to the origin of which lumbering operations contributed their part, Chief United States Forester W. B. Greeley called a meeting of California lumbermen to convene in joint session with Forest Service officials at Sacramento in 1925. At this convention plans were worked out to place still tighter restrictions on lumbering operations on public lands as well as to set a pattern for private land logging. Trained fire patrolmen for each operating area, fire-fighting tool caches at strategic points in the woods and smoking by employees only at designated times and places, were among the practices agreed upon at the meeting and these, to some extent at least, were applied by lumbermen to their own lands also.

The California lumberjack of the twenties was quite a different type from his predecessor of the Lake States, whose life and times have been immortalized in Stewart Edward White's famous novels. The cat-skinner and truck driver had replaced the horse-loving teamster of the old days, and the mechanic manipulating levers had greatly curtailed the use of the time-honored peavy, or canthook. While the crosscut saw and axe were still the standard tools of his trade, the user thereof, as well as his co-worker mechanic, was now paid wages commensurate with the skilled worker in many urban lines of endeavor. Socially, the change in his status was still greater. A lumber jack of the traditional Paul Bunyan period, stepping into a logging operation in these more modern days, could only rub his eyes in amazement as he witnessed the changes which time and environment had wrought.

Neat frame, four-man cottages had replaced the former rude log structures in which scores of men jointly lived, moved and had their being during off-work hours; white sheets spread over spring mattresses had been substituted for the vermin-infested blankets and straw ticks of a former era; modern plumbing and sanitation had taken the place of the bathless camps of the old days; substituted for the pork and beans of the old bean hole were balanced, tasty meals, prepared by highly-paid chefs; electricity, reading materials and recreation rooms were all part of the modern camps. The average lumberjack owned a car for trips to the nearest town and if married, could now reside with his familin in comfortable living quarters; then too, even with much higher wages rewarding his efforts, he no longer worked the clock around as did the traditional Paul Bunyan and his associates.





## Pine Bark Beetles

Just before and during the early twenties, a new threat, equalling and perhaps exceeding that of fire, came to California's pine forests, in common with other pine regions of the far Western states. To use common names, this menace was embodied in the Western pine bark beetle, or pinebeetle, which attacked ponderosa pine and its twin tree, the Jeffrey pine, and the mountain pine beetle which concentrated its efforts mainly on white pine, sugar pine and lodgepole pine. The Western pine beetle, first of all California's timber insect pests, has caused tremendous losses to California's main lumber tree through the years since and become one of the acute problems in forest land management.

Altho during the years of the first World War and those immediately preceding and following, a certain number of trees in the State's ponderosa pine regions were killed by the western pine beetle (*Dendroctonus brevicornis*) and its inroads were fairly familiar to local entomologists, neither foresters, entomologists or lumber men were prepared for the first real epidemic of this bark beetle infestation which swept thru the forests in the early twenties, extending over from Oregon into Modoc county in the north and down south thru the Lassen, Shasta and Eldorado National Forests into the Sierra National Forest in the central part of the Mountain and Plateau Region. During 1921, in the heart of the infested region of western Modoc county, 6,280 board feet of timber per acre on one 320-acre sample plot was destroyed. On another representative plot of the same size, 7,706 board feet of timber was killed. Such infestation represented approximately forty percent of the entire stand of merchantable timber on the areas concerned.

Major Western pine beetle epidemics swept thru the pine region during the years 1921-22, 1926-27 and 1929-30, lesser epidemics occurring during intervening years. The epidemic spread thru the scattered ponderosa pine regions of Southern California also, altho the trees killed in that section represented more of an aesthetic rather than a financial loss.

Modoc county was the hardest hit, the entire ravages of the pine beetles through the twenties and the succeeding decade resulting in the loss of approximately twenty percent of the entire timber stand. The estimated loss on some 400,000 acres of the best timberlands of that county was 45 million board feet of timber in 1921 and 184 million board feet in 1927, after lessening losses during 1928 to 1930, to again rise to a 106-million board foot loss in 1934.

All in all, some seven million acres of timberland in the State, embracing a stand of sixty billion board feet, were attacked to a greater or lesser degree during these outbreaks. Some idea of the



seriousness of the threat to the State's timberlands may be gleaned from the fact that destruction of one hundred million board feet of timber means a three hundred thousand-dollar public revenue loss when applied to standing timber at current stumpage rates and a two-million-dollar loss expressed in terms of logs delivered at the mill site.

Pine beetle losses resulting from endemic infestations caused the foresters and entomologists little worry, since fairly complete control could be exercised by routine treatment and local utilization of infested trees, but when such ravages reached epidemic proportions, the problem was a huge one. Since the timber-destroying beetle made no distinction of land ownership in their depredations, the problem was a joint one of both timberland owners and the custodians of the Federal forests. So far as possible, trees attacked by the pests were cut down and utilized before they became - within two or three years - "sour sapped" or unfit for lumber, but this means of control was but a drop in the bucket of the whole problem.

Control operations during the epidemic outbreaks reduced the loss fifty to seventy-five percent during the year immediately following, with a greater percentage of loss reduction in subsequent years. It may well be surmised that the different agencies interested lost no time in applying control measures within the limits of available finances of the Bureau of Entomology, the Forest Service and private land owners.

As far back as 1916 the McCloud River Lumber Company had been carrying on insect control operations on their lands in Shasta county. The Pickering Lumber Company quickly swung into action and up to 1930 with the two Federal agencies interested had jointly expended \$300,00 in control operations in the Modoc county area of infestation alone.

Altho there are other methods, the commonest and most effective means of Western pine beetle control and the simultaneous control of their invariable, but less menacing forerunners, the flat-head borers, was by burning operations carried on during the winter months.

The Western pine beetles killed the tree by cutting tunnels thru the cambium, or inner bark, lying between the bark proper and the green growing sapwood, their operations having exactly the same effect as girdling a tree with an axe. The veriest layman, looking over a forest, can at once detect a "bug-killed" tree by its dead, brown foliage, but by the time the tree has reached such a stage the broods of the tree-killing insect have left the scene of their conquest and moved on to greener pastures where they are



busily depositing their larvae in live trees, to tunnel their way thru the cambium layer, reach the adult stage of their existence, emerge and continue their depredations on still other trees.

It was the aim of the entomologists and foresters to locate and treat a tree while the multitudinous larvae were still actively working and while the tree was yet alive and green. This work developed foresters with an almost uncanny sense of perception, known as "spotters." The tree in the process of being killed was just a little off color, but was instantly recognized by these trained forester-entomologists.

These spotters, working with compass men running strips thru an area of infested timber, marked the trees to be treated. They were followed by two-man treating crews who cut down the tree, peeled the bark therefrom and piling limbs, brush and other debris around the hole and stump, set the whole mass ablaze. In this arduous treating work expert sawyers and axemen again came into their own in the California woods. Because of the magnitude of the task and the large areas to be covered with limited Federal appropriations and private funds, treating crews were required to maintain a standard volume of performance, reachable only by husky, experienced woodsmen.

The Western pine beetle proved himself a hardy creature. Big control operations were being carried on during the winter of 1931-1932. One of the severest cold spells ever experienced hit the State that winter, in the lower areas giving thousands of California children their first close-up view of snow, and in the mountain region producing temperatures of thirty below and colder.

Expert foresters and entomologists were jubilant. Nature herself was taking a hand in the fight against the pine beetle. The frost had penetrated the thick bark of the ponderosa pine and frozen the insect invaders solid. Control operations were abandoned and the lumberjacks saw their hopes of a prosperous working winter going glimmering as they returned to the ranks of the unemployed. Some weeks later, however, the joy of the bug fighters turned into mourning when it was discovered that the pine beetles were only temporarily allergic to frost and had continued their depredations with as much vigor as ever.

Foes of conservation and those in favor of the more immediately profitable "cut-and-get-out" method of handling timberlands found an excellent opportunity for asserting that the policy of keeping uncontrolled fire out of the forests was responsible for these tree-killing insect outbreaks. They further argued that if fire was again allowed to run freely thru the timberlands the problem of bark beetle infestation would be solved. Even some of the







forest scientists themselves would have liked to sponsor this theory as a justification of the beetle menace to the California forest but honest minded entomologists, after years of patient investigation, found the exact opposite incontestably true. They found that fire encouraged rather than checked pine beetle since lowered resistance of trees scorched by fire made them much more susceptible to insect attacks.

"True, they encountered the charges of the anti-conservationists, you could kill the bugs by wholesale burning but you would entirely destroy the forests as well; might just as well burn down your house because there are mice in the cellar."

These forest scientists also proved conclusively that similar epidemics had assailed California's forests back in times when the existence of a few hundred million trees, more or less, made no difference one way or another to the Indians exclusively occupying the California commonwealth.

### Minerals

The following figures, showing the value of California's mineral production, indicate the trend of this form of land use during this period of the State's history:

#### VALUE OF PRODUCTION BY GROUPS

	<u>Fuels</u>	<u>Metals</u>	<u>Structural Materials</u>	<u>Industrial Materials</u>	<u>Salines</u>	<u>Total</u>
1	207,906,481	\$21,217,849	\$33,470,250	\$2,675,438	\$2,887,354	\$268,157,472
5	346,503,791	24,414,706	53,526,807	6,397,064	4,695,292	434,519,660
9	350,436,995	16,514,923	46,754,123	7,581,740	10,960,557	432,248,228
2	159,198,776	12,366,280	17,675,285	3,820,712	6,135,440	199,196,493

California's yellow gold output could not begin to hold a candle to her tremendous petroleum production but nevertheless, still annually continued to hold third and fourth place in value, being exceeded in individual production only by the more prosaic cement and miscellaneous building stone.

A fact indicative of the times was that the value of gold production which fell off materially from 1922 to 1929 - approximately fifteen and three-quarter million dollars in the former year and one-half million in the latter - increased during the depression years of 1930, 1931 and 1932 when other mineral production so greatly declined. In 1932, California's gold output, according to official figures, was \$11,765,726. That year California's gold production was well along on the spectacular climb which was to mark the ensuing years of the "depression gold rush,"



as thousands of small operators added their little individual quotas to the State total.

Silver production cascaded steadily downward from an all-time high of \$3,629,000 in 1921 to an all-time low of \$139,176 in 1932. Quicksilver's darkest year was in 1921 when only \$140,000 worth of this metal was produced in the State. After that it climbed steadily, however, reaching well over the million-dollar production mark during the years 1929-30-31, its output to drop again in 1932 to a figure given officially as \$279,780.

Copper production of the State which was \$1,559,000 in 1921 climbed to \$6,823,000 in 1924, to drop to \$1,179,000 in 1931 and down to \$89,307 in 1932. The production of tungsten which had reached such a high figure during the years of the first world war, dropped so low during the twenties that it was not even listed individually by the official statisticians in seven of the thirteen years of 1920 to 1932, inclusive. The highest production of tungsten during this period was \$446,000 in 1924. In 1932 official statistics showed the value of the State's tungsten output as less than ten thousand dollars.

Industrial minerals such as pottery clay, bentonite, feldspar, pyrites, gypsum and limestone, showed a steady production increase until the depression years of the early thirties. Mineral water seemed to hold its own better than the others listed in this class, the value of the output rising from \$367,000 in 1921 to a peak of \$2,870,663 in 1930. Its production, however, dropped the following two years, and down to a value of \$1,496,000 in 1932.

Salines in general suffered the same fate as other classes of minerals when depression years began to pinch. The production value of borates, however, increased from \$1,096,000 in 1921 to \$3,379,000 in 1928, to \$5,753,000 in 1931, dropping the following year to \$2,856,000. Salt and soda, both in the million-dollar production class in the latter twenties, dropped to a production figure of \$198,000 and \$826,000 respectively, in that dark industrial year of 1932.

The production of cement was given a value of \$18,072,000 in 1921. By 1927, this had increased to an all time high of \$26,476,000 from which point it gradually dropped to a production value of \$7,967,000 in 1932. In 1923 the nine cement plants in the State produced 10,825,405 barrels; in 1925, ten plants manufactured 13,206,230 barrels and in 1927, the twelve plants then in operation processed 14,105,000 barrels of this universally used building material. As in former decades, practically all California cement was used locally.



Next to cement, brick and hollow tile, and building stone were leaders in the structural materials being mined from California lands. The California State Division of Mines reported that brick and hollow tile to the value of \$5,570,875 was produced in 1921; a total of \$7,503,000 was reached in 1925, production gradually dropping during the next seven years to a value of \$1,605,000 in 1932. Their figures show a somewhat corresponding decline in the production of miscellaneous building stone the output of which was valued at \$7,832,942 in 1921 to rise to \$19,859,261 in 1926, then gradually declining to \$11,848,531 in 1931. with a further drop to \$7,183,643 in 1932.

### The Oil Industry

The immense reservoir of oil which nature placed beneath California's lands is a subject of which local historians never tire. Not content with planting a hoard of gold in her rugged canyons, covering her mountain slopes with giant forests and providing climatic conditions suitable for the most intensive agricultural development, Mother Nature outdid herself in the lavishness of California's petroleum deposits.

All the color and excitement of the days of Forty-Nine was present in the California oil fields, less appealing and romantic only because closer to our own times. And while petroleum development came largely after conservation ideas had permeated the national and State consciousness and there was markedly less land abuse in connection with the extraction of this black gold from the earth, the oil industry did produce its fair share of land frauds and monopolistic practices. So different from any other line of endeavor was California's petroleum industry that oil fields even produced a vernacular of their own quite foreign to the ear of the outsider.

In 1921, California's petroleum output was 112,599,860 barrels, valued at \$203,138,225; in 1926 this output had risen to 224,673,281 barrels worth \$345,546,677. The two following years each showed an approximate thirty percent decline from the 1926 figure, to rise again in 1929 to a production of 292,534,221 barrels, with a raw material valuation of \$321,366,863. Keeping pace with the current industrial depression, production greatly slumped during the three years following, being placed at 177,745,286 barrels in 1932, having a well-side value of \$142,890,247.

Production of oil was not gauged so much by availability of the supply as by the capacity of the world markets to absorb the output. In 1923 the United States of America pumped from the earth 732,407,000 barrels of oil, or 71.9 percent of the world's total production. Almost one-third of this national production came from California lands.







The new Huntington Beach field had come into production in 1920. In 1921 the Long Beach and Santa Fe Springs fields were discovered. These three fields together alone pumped 182,946,000 barrels of oil in 1923, and 103,964,000 in 1924. It was at Long Beach, over which a few years previously bands of sheep had peacefully grazed on the lands of the old Nieto Spanish grant, that space-occupying oil wells took to an urban life, as a forest of derricks rose on city lots in the rich oil section known as Signal Hill. Owners of small-sized building lots became rich overnight as the 120-foot derricks were constructed in residential sections on an approximate average ratio of one of these huge derricks to four of the city lots.

By 1924, California had three main oil fields as follows:

1. Valley Field (South San Joaquin Valley), which included the Kern River, McKittrick, Midway-Sunset, Lost Hills, Belridge, Coalinga, Wheeler Ridge and Elk Hills areas.
2. Coast Field: This included the Watsonville, Santa Maria, Newhall, Ventura and Summerland-Carpinteria developments, in the last-named of which many of the wells, located some distance out from the shoreline, were pumping oil from beneath the waters of the Pacific Ocean.
3. Southern or Los Angeles Basin: This field included the derrick forests of Santa Fe Springs, Signal Hill, Huntington Beach, Whittier, Fullerton, Coyote, Montebello, Richfield, Compton and Torrance.

As if these already-producing rich fields were not sufficient, an equally rich if not richer oil field was discovered and first developed in 1928 in the barren Kettleman Hills, located mainly in Kings county. In this new field one of the most famous oil wells in existence anywhere and at 8,323 feet, the deepest in the world, came in with a rush in December, 1930. This well, known as Huffman No. 1, produced an average of 11,090 barrels of oil daily as well as 2,466 cubic feet of natural gas for each barrel of oil gushing forth.

Milham Well, also in the Kettleman Hills, in 1930 was alone producing more natural gas-which was piped to San Francisco-than that city and its surrounding sister cities and towns of Bay Region could consume. Some of the wells in this section produced oil which was three-fourths gasoline and which could be used to operate the ordinary gasoline motor without going thru any refining process whatever.



Still more spectacular in many respects was the Lakeview Well, located near Bakersfield, in the Valley Field. This gusher came into existence some years earlier than the famous wells of the Kettleman Hills and was considered California's greatest oil well. At the height of production this great geyser of oil spurted forth 68,000 barrels per day. During its most active years it produced six million barrels of oil worth five million dollars at the source, then settled down to a sedate production of eight barrels a day.

With oil men drilling a mile and half, and deeper, into the bowels of the earth and working with unseen tools, the petroleum industry called for many special techniques. In the crowded areas where derricks stood shoulder to shoulder, as it were, to prevent one well draining the underground reservoir or pool tapped by another, the wells were drilled at each of the four points of a diamond, three hundred feet on each of its four sides. Because of the pattern of small land holdings in some of the fields this method was necessary also to keep rival concerns at a distance. Many ingenious methods were developed by men using tools operated by cables thousands of feet in length thru the medium of a hole a few inches in diameter.

Holes were started with a diameter of 18 to 24 inches, narrowing down to six or even five inches by the time the bottom was reached. By this narrowing-down process the massive steel casing forming the inner limits of the tunnel rested on a natural shelf far down beneath the surface of the ground. Cement, generally in a pure form, was used freely and the long vertical tunnel into the earth, in its final state, was a solid steel tube enclosed in a concrete wall. As indications of the close presence of oil became evident to the drillers, every precaution was taken to prevent the oil from gushing forth. In spite of all such precautions, however, geysers of oil often belched thru the vent provided by the drilled hole inundating the surrounding area with a veritable ocean of black, vicious fluid. Worse still the highly inflammable liquid ignited by some chance spark, at times, produced a fire of disastrous and tragic proportions.

Land values in producing and potential oil areas leaped to fantastic heights overnight. Generally, leases were secured from land owners on a royalty basis, the party who actually did the drilling assuming all the risk. Leases were bartered from hand to hand and their manipulation was a sinecure for the land shark. The magic name of California was used to promote and sell spurious oil stocks and millions of dollars worth of worthless paper was unloaded on investors as gilt edge securities. Fortunes were sometimes made on lands which gave only a faint promise of future oil production.



One group of Fresno men bought a tract of 800 acres fairly close to a producing field but with oil possibilities so remote that the owner was glad to sell at a price of \$12.50 per acre. With little prospect of oil developing on the land, the Fresno group, whose motives were purely speculative, jumped at a price of \$50.00 an acre for 600 acres of their holding, four times the price paid. A few months later they sold the remaining 200 acres for a price of \$3,000 per acre.

Gradually the great bulk of the oil industry passed into the hands of the big operators, the Standard, Union, Shell and similar large corporations. By 1924 some 500 million dollars had been invested in California's oil industry which included besides the oil wells and equipment, 65 refineries and 4,500 miles of pipe lines conveying oil to these refineries or to storage centers. Seventy thousand people were employed by the industry within the State, and over 400 different products were being made from California's crude petroleum.

Oil was stored in hugh steel or concrete reservoirs on what became known as tank farms. Individual steel tank storage capacity ranged from 35,000 to 175,000 barrels; concrete tanks averaged much larger. By 1924 the State's oil storage capacity had reached ninety million barrels. The Standard Oil Company had one immense concrete storage reservoir at their El Segundo location in Los Angeles county with a capacity of three million barrels. The great storage plant at Richmond on San Francisco Bay, terminal of the Standard Oil Company pipe line laughed at by the farmers of a previous decade, comprised acres and acres of tanks, and the population of the city of Richmond itself had grown in a comparatively few years from 200 people to 23,000.

Commensurate with the increased auto travel, the large oil concerns such as the Standard and Union, established and operated their own chains of the now familiar service stations up and down the State, both in the urban centers and in rural communities.

Following the lead of the railroads, oil became the fuel to furnish motive power for ships. One-third the price of coal and of no greater weight in relation to its bulk, oil soon revolutionized ocean transportation. It was natural, perhaps, thru the medium of this new fuel for ships that Captain Wm. Matson and his associate, Captain John Barneson, very practical sea captains, should become prominent figures in California's petroleum industry and incidentally ocean transportation magnates as well.

Other personalities sprang into prominence in connection with California's oil industry. Altho often painted by contemporary authors as black-hearted, ruthless monopolists, some of these







leaders played a big part in the economic development of California. Edward L. Doheny, whose name was so badly tarred in the Teapot Dome incident; D.G. Schofield, another pioneer in the oil game; Paul Shoup, a self-made man and official of the Southern Pacific Railway Company, and other wealthy and influential citizens left their impress on the great industry.

Lyman Stewart, call the "Grand Old Man" of Western Oil, was the founder and moving spirit of the Union Oil Company, with an obsession for the betterment of the firm's workers. It is said that Stewart always carried a bible with him and invariably opened the directors' meetings with prayer. This pioneer founder of one of California's largest oil concerns stayed in harness till his death in 1923, when the presidency of the Union Oil Company was taken over by his son, W. L. Stewart.

It may justly be said that it required men of wealth and combinations of capital to successfully carry on in the oil industry. A checkup in 1930 showed that 169 wild-catting attempts carried on that year in the United States failed to produce oil in paying quantities. These 169 wells were drilled to an average depth of 5,920 feet and \$25,000 to \$50,000 was spent on each of the unsuccessful ventures.

There seemed to be no limit to California's store of petroleum. In 1929 geologists and oil experts estimated that in addition to natural oil there were nearly fourteen billion tons of oil shale in California, with a potential yield of five billion barrels.

At the beginning of the third decade of the 20th century so much oil had been produced in California that prices at the point of production dropped from two dollars to fifty cents a barrel. Gasoline price wars, waged by rival concerns, became a familiar occurrence and competition in the matter of retail sales very keen. In 1931 California produced twenty-five percent of the entire national output and combined with Texas and Oklahoma, eighty percent of the total. On recommendation of the Federal Oil Conservation Board an agreement between States was entered into to control the output. While this somewhat smoothed out the matter of overproduction, fortunes continued to be made in "bootlegged" gasoline handled by the smaller oil concerns.

With the unlimited supply available, the State's consumption of natural gas greatly increased during the twenties. According to figures prepared by the State Division of Mines, the peak production of natural gas was reached in 1929 when well over four hundred billion cubic feet, valued at \$29,675,000 was marketed. The production in 1921 had been slightly over sixty-seven billion cubic feet, with a value of \$4,074,000. The industrial depression



forced production downward after 1929 to a figure of 284,168,000-000 cubic feet in 1932, with an output value of \$16,272,000.

One marked feature of California's oil industry was the fact that just as the original potentates in that field had themselves sprung, as it were, from the oil-soaked soil, so the policy of such large concerns as the Standard and Union followed the system of bringing their leading executives up from the ranks of the field workers. In these big concerns an esprit de corps of a high order was developed and the man in greasy overalls working around well rig, or the sales manager expanding the Company's business, were given to understand that promotion to the top jobs lay within their own grasp. The spirit of loyalty developed by such a policy is vividly illustrated in Alice Tisdale's\*book, "Oil for the Lamps of China." A decidedly reverse picture is painted by Upton Sinclair in his perhaps equally well known novel "Oil!" in which he portrays the exploitation of the oil workers by the wealthy preferred stockholders of the big companies.

#### California's Cooperatives

California cooperatives continued to expand in spite of occasional legal clashes with combination of capitalists seeking to wrest from them control of the product handled by some particular mutual land users organization.

Under the Sherman Anti-Trust Law powerful moneyed interests brought court suit in the early twenties against the California State Raisin Growers Association. This cooperative, founded mainly by the efforts of M. Theodore Kearney, English-Californian, by 1913 was handling ninety percent of the State's raisin crop. Like the Sunkist citrus fruit, its product, Sun Maid Raisins, had become internationally known. By 1921 ninety-three percent, or 10,700, of the State's raisin growers were members of this cooperative and their 1920 crop brought in returns of \$38,416,000.

The suit against this cooperative was dismissed in 1922, but brought a caution from the Federal court against any tendency towards monopolistic practices. The members of this farmers' marketing organization felt that the government was warning them against doing what they never intended to do in their marketing practices. This suit, widely publicized, greatly strengthened the position of this and other farmer cooperatives.

The California Fruit Growers Exchange, altho having its greatest membership in Southern California, had spread out pretty well over the State in general and in 1927 controlled 22 districts, over 200 packing establishments, and boasted a membership of

\* Alice Tisdale Hobart



11,000 individual citrus growers. Handling 75 percent of the State's annual production of some eighteen million boxes of oranges, lemons and grapefruit, it was not only a marketing enterprise but a service organization to its members as well.

This land users' organization was one of the world's finest examples of cooperative agricultural effort. It taught its farmer-members hundreds of details in caring for their orchards. The fruit itself was taken from the trees not by plucking but by cutting the stems. Special picking sacks were contrived and these were gently unbuttoned to ease the fruit into boxes rather than by dumping. The cooperative organization, besides developing many such details to insure careful handling of its fruit products, disseminated information among its members relative to spraying, cultivating, pruning, fertilizing and other details in connection with the handling of their citrus groves.

Spending millions of dollars annually in national and world-wide advertising, the California Fruit Growers Exchange also represented a tremendous agricultural buying power. In 1929 its purchase of tissue wrappers and box labels, as well as fertilizer, orchard heating equipment and specially-grown nursery stock for its members totalled some ten million dollars. This cooperative also went into the lumbering business. Controlling around 70,000 acres of timberland in northern California and purchasing large quantities of stumpage from the Federal government, it operated its own large capacity sawmill and box factory plant at Susanville and was thus on an independent basis in providing for its own heavy lumber needs. Its trade name of Sunkist was known around the world.

### State Colonization

In contrast to the success of large agricultural cooperatives such as the two just mentioned and the usually successful private land colonization schemes of earlier years, the State-managed colonization projects at Durham and Delhi made a rather poor showing. As against private enterprise where the utmost individual efforts of each colonist was exercised for the benefit of the entire community cause, the settlers on the State projects were prone to place too much dependence upon salaried State employees.

The officials administering the State's colonization efforts were also handicapped throughout the progress of the experiment by the drop of farm land values in the surrounding areas. In Butte county, farm lands which jumped from an average of \$44.19 per acre in 1910 to \$102.04 in 1920, declined in 1925 to \$85.27 per acre, and in 1930 to \$77.96. In Merced county, the average acreage value rose from \$36.47 in 1910 to \$77.77 in 1920, and to \$97.09 in 1925 but slid back to \$82.01 in 1930.







The original Durham colony was much more successful all the way thru than that of the following Delhi colony. By the late summer of 1922 all but three of the Durham farms had been taken up by settlers on a basis of 31 laborers' allotments, 10 poultry farms of 3 to 12 acres, and 90 general farms. That year 3,670 acres at Durham were producing a wide variety of field and orchard crops and 1,650 acres were in pasture or summer fallow. Prospects were rosy and the State Colonization Board members were elated. It seemed now that a plan had been worked out whereby the landless man could be established on the manless land by a system of official land colonization which would be eventually maintained on a self-supporting basis.

Dark days dawned, however, even for the fairly successful Durham colony. Ill-advised crops were planted. Poorly drained soil was utilized for sun-loving orchard crops and some of the lands became water-logged.

One of the farm allotments was sold in 1918 for \$8,366.40. For the 39.4 acres which it contained the purchaser had paid the State \$1,100. cash and put improvements on the place to the value of \$5,500, giving him an equity of \$6,600. He in turn sold his equity to another party for \$5,500, which made the price to the second purchaser approximately \$12,770 and his debt to the State \$7,266. The poor drainage conditions ruined the fruit trees on the farm and the second purchaser sued the State as the responsible party. Similar cases marked the progress of the State's land colonization ventures. While the State was not legally responsible for losses and failures of individual settlers, for fear of political consequences which might be detrimental to their experiment, it did actually assume such responsibility.

Meanwhile, settlers on the Delhi colony, many of them with little or no farming experience, were battling high winds, sandstorms, bamboo fever and crop uncertainty. State officials were trying to bolster morale by aiding in the establishment of cooperatives, breeders associations and organizations for the betterment of social life, with but indifferent success. In 1922 only, 2,000 acres of the entire colony land was growing crops and all during its official history there were never enough settlers on Delhi colony lands to take up the available farms.

In February, 1924, there was for sale in the colony 32 partially developed farms and 35 farms piped with water ready for occupancy. Meanwhile the State's voters, watching the progress of this official colonization experiment, turned down a proposed bond issue of three million dollars to increase the land colonization program. At the end of that same year, the State had on hand in the Delhi colony, unsold, 3,528 acres of land, valued, so far as could be learned from the complex methods of bookkeeping used at \$933,527.



Shortly after the Delhi colony got under way a survey showed that 258 settlers had average assets of \$4,128, of which \$1,325 was cash and \$1,423 equity in land. However, 23 of these settlers held one-third of the assets of the entire colony. In 1922, debts of settlers, including some unpaid interest, amounted to \$300 per acre of land under settlement, but by 1925 this figure had reached \$352 per acre. The grand total indebtedness of the settlers was reduced only from \$1,438,070 in July, 1925, to \$1,326,973 in January, 1929, altho special financial aid had been extended to the colonists by the State Legislature in the former year. An appraisal made by State officials on January 1, 1929 showed an average shrinkage in value of land, permanent growing crops (trees and vines), and buildings, of 54 percent from 1925.

The majority of the Delhi settlers were veterans of the armed forces and their fight to secure their farms from the State free of charge, or at prices greatly below the original cost, was a major political issue for years. The final settlement made in 1930 by revaluation of the land and rescinding of payments cost the State \$427,995 for the Durham colony and \$2,097,521 for the Delhi colony. These settlements were made with individual colonists on the merits of the particular case involved.

While the larger farm units were pretty much of a failure, particularly in the Delhi colony, the laborer allotments were fairly successful and most of these smaller units were clear of debt shortly after settlement. These laborer allotments were an honest attempt to provide a permanent home for migratory farm workers. It is difficult to state just what degree of success these tiny farm proprietors would have attained had it not been for the large volume of work afforded them by the State in connection with irrigation works and other construction on the colony projects themselves.

The reason for the failure of these State colonization projects may be summed up briefly as (1) Inability to secure proper types of land; (2) land prices too high in the original purchase; (3) overdevelopment of such ventures as laying out townsites on each project when better urban centers were easily reached by later auto transportation; (4) too much State supervision and (5) general economic changes and nation-wide depression conditions.

Dr. Elwood Mead, the leader and moving spirit in this State venture never lost faith in the idea that State-subsidized colonies were the answer to California's rural economic problems and fought bitterly for a continuance of the venture. He resigned as head of the Land Settlement Board in 1935. It is quite possible that had Dr. Mead and his associates been given a free hand, in the light of lessons learned from the original experiments, later colonization enterprises might have been successful.



### High-Priced Lands

About the time California's Land Settlement Board was getting under way, Professor R.L. Adams, agricultural and irrigation expert, after checking a wide range of land use in all sections of the State, produced the following interesting figures showing the cash capital requirements in different types of farm ventures until such became self-supporting enterprises:

Types of Farming	Average Size of Farm		Capital Needed for		Total
			(a)Equipment	(b)Establishment	
Orchard -----	320	acres	\$6,000	\$2,850	\$8,850
Wheat -----	20	"	3,300	1,500	4,800
Poultry -----	2,500	fowls	4,800	1,275	6,075
Dairy -----	20	cows	5,700	2,200	7,900
Diversified -----	40	acres	4,500	2,375	6,875

We find Professor Adams in 1924 telling the Commonwealth Club that in spite of the efforts of Chambers of Commerce, the State Land Settlement Board and various land-locating agencies, settlement of California's irrigated lands was moving very slowly. He then stated then:

It is very clear that the colonization of California farm lands present many difficulties which will not be easily overcome. The problem is sensed but not being met, and no one has pointed out a plan of general application ... The impression ... is that we must seek settlers among those who have a capital of from five to six thousand dollars up. Some of the Chambers of Commerce are frankly advising those who have less capital than this to stay away from California. On the other hand, the general colonization agent of the Santa Fe Railroad . . . states that seventy-five percent of the prospects with whom they come in contact possess \$2,000 or less in actual cash, with only a small percentage whose capital exceeds that amount.

California landowners had plenty of land to sell but in the main were looking for high prices and quick profits so it was little wonder that in the twenties rural land sales experienced somewhat of a slump in spite of national advertising and a great deal of actual ballyhooing.





The California Improved Land Settlement Association, organized to subdivide and dispose of farm lands, had holdings of 500,000 acres in 1924. No member of this organization could own less than 1,000 acres of farm land - many of them owned very much more. That same year Californians Incorporated, a progressive organization dedicated to California development, located between 500 and 600 farm families on lands in northern California, a very much larger aggregate colonization venture than the official State land settlement activities.

The public-spirited Commonwealth Club in the mid twenties was very much motivated by the idea that some program must be developed to get as many as possible of the most desirable farmers on lands from the class whose cash capital was \$2,000 or less - by some happy medium between the State colonization plan and the quick cash turnover methods in vogue in the commercial marketing of land subdivisions. One county farm advisor reported to them that land in his district which might have a fair value of \$150 per acre with water was being sold for \$200 to \$300 per acre and that the purchaser "just could not pay out." A farm advisor in another county revealed that subdividers were selling lands to new settlers for \$400 an acre when adjoining lands of the same quality could be purchased for \$100 an acre.

Many homesteaders of the nineteenth century, who had acquired 160 acres of land as a gift and had seen their homestead lands develop into eight or more prosperous fruit farms, had become moderately wealthy from the increase in value alone of the land included in their erstwhile farm units and were probably now living a retired existence. The big landowner who could clip off a piece of his holdings, subdivide and sell at perhaps several hundred times its original cost, by the same token was included in the millionaire and near-millionaire class. One contemporary describes another class of small rural land owner with the phraseology, "Southern California is populated for the most part by retired farmers from the Middle West, who have come out to die amid the sunshine and flowers." This last-named class, inherently agricultural by nature, often invested the entire cash returns from the sale of their farm on the Western plains in a small orange grove of doubtful quality.

Gullible Easterners in possession of a few thousand dollars, fascinated by the kindly California climate, fell for the siren call of the real estate shark and invested their lifetime savings in land use ventures which spelled later ruin. With almost unlimited potential customers, the real estate business in California became a leading industry, altho the brokers themselves were usually mere selling agents, employing the most spectacular methods in



land salesmanship. Oil lands, timber lands, and farm lands changed hands with lightning rapidity as more and more people came to California - often to stay and try their luck with such finances as they possessed.

Unscrupulous real estate promoters drilled deep wells in arid regions and developed fruit and alfalfa farms which, used as show places, constituted a bait to lure purchasers to invest in adjacent worthless lands. Orange groves were planted in frosty locations and carefully shown to prospective purchasers only when they looked their best.

Orange lands proved the greatest magnet to the outsider visualizing a Utopian existence amid Christmas roses and oranges. An impartial survey of orange orchards in California during the latter twenties disclosed that approximately one-third of the orange groves were worthless because of poor soil, frosty location or inadequate water; about another third either thru ignorance or indifference were improperly handled and therefore, unprofitable, while the remainder showed returns of three and one-half to four boxes of fruit per tree, which constituted a prosperous standard of production.

Such figures, published by public service agencies, had comparatively little effect in meeting the competition of a combination of lurid advertising by land-selling enterprises and avid seekers after a charmed Arcadian existence. Many a small would-be orange farmer in the course of a few years sojourn in the State found themselves not landed proprietors, but struggling tenant farmers or part of the parade of transient farm workers.

To place a curb on the sharp practices in the buying and selling of real estate and for the mutual protection of honest dealers, the California Real Estate Association was incorporated under the State laws early in 1928, a forerunner of official State action along the same line. Adopting a code of business ethics based on fair land values and square dealing, this organization did much to curb shady land transactions. The real estate broker now became a "realtor," and obligating himself to follow high professional standards, a member of a recognized honorable calling. There was the heaviest of competition in this line of endeavor, however, and general industrial depression conditions rather than high professional ethics in land selling practices were responsible for any decline in the high prices of California rural land.





## Millionaire's Ventures

It was not always the modest investor who suffered financial loss in California land-using ventures. Back in 1913, J. Ogden Armour, millionaire meat packer, became the moving spirit in the development of delta lands in the Feather and Sacramento River Basins. Incorporating as the Sutter Basin Company, Armour launched his project with a six-million dollar capital stock. Using the lands where Sutter grew his wheat as the basis of security, the firm in 1922 issued \$7,500,000 in mortgage bonds. These were personally endorsed and guaranteed by J. Ogden Armour to cover both principal and interest. The great meat packer, altogether, invested some seventeen million dollars in the scheme, which proved a failure. Armour, having pledged his personal and business honor in the project, felt obliged to make the bonds good, and died bankrupt.

Nationally-known multi-millionaires built show places in California, sometimes for personal playgrounds, at times for public amusement or education. In 1919 Wm. Wrigley, Jr. and son got hold of Catalina Island, one of the twenty islands off the southern coast of California and famous as a sports fishing center. In their expensive landscaping scheme the new proprietors transplanted 500 palm trees alone at a cost of \$200 each. They imported five thousand birds from all parts of the world, and altogether expended millions in making this area a leading tourist attraction of the State.

As a private retreat, further north, in Monterey county, William Randolph Hearst added to his already large California land holdings by the purchase of around a quarter-million acres formerly included in old land grant ranches. Here the millionaire newspaper publisher built a structure resembling a medieval castle which he adorned with art treasures from all parts of Europe, stocked with pure-blooded livestock, and landscaped with exotic fruit and ornamental trees.

This Hearst's San Simeon Ranch, as it was generally known, included a massive masonry esplanade overlooking the nearby Pacific and became the home of wild animals imported from all over the world. The main building had all the appurtenances of a feudal stronghold - a central dining hall of the ancient baronial type, portcullis, keep, moat and drawbridge. Perched atop a prominent eminence, it was visible for miles and after nightfall as its flashing lights gave evidence of the presence of the lord of the manor. On this huge ranch, as his main activity, Hearst engaged in practical livestock production after the manner of the early-day rancheros, substituting purebred animals for the cattle and wiry ponies of a previous era.



In a decidedly different environment was the elaborate castle built by "Scotty" of Death Valley fame. Death Valley, which might be termed the mystery land of California, is a lodestar for thousands of tourists and is now administered by the United States Park Service as a national monument. One hundred and thirty miles north and south, with a width of from six to fourteen miles, it hugs the California-Nevada state boundary in the southern sector of the State. Ascribed as the hottest place on earth, it owes its name to the toll of human life taken of pioneer prospectors and emigrants who strayed within its barren wastes. Poisonous springs, beds of solid salt and rich borax desposits are all found within its boundaries. Its desolate expanse and freak geological formations embraces the Funeral Mountain Range, the highest point of which, Telescope Peak, rises to an elevation of 11,045 feet, while almost at its feet is located Bad Water Sink, 280 feet below sea level.

It was in the extreme northern end of this bizarre region that Walter Scott, former cowboy and showman, elected to build his palatial castle, a two-million dollar structure located in the most barren and forbidden spot on the continent. Forty-eight miles from a railroad, with walls two feet thick and hand-carved woodwork, this castle represents the utmost in fantastic and unusual architecture. The hardware in a single room represented the entire cost of an ordinary dwelling. The furnishings of the music room alone cost \$75,000 and a great pipe organ, \$50,000.

The much-publicized comings and goings of "Death Valley Scotty," who was supposed to hold the secret of the location and be the sole proprietor of a fabulous El Dorado in those mountain fastnesses, entertained the American public for a generation. Hundreds of prospectors braved the hardships of Death Valley searching for the supposedly existent rich gold deposits of the region on which "Scotty" drew, some of them meeting death in their wanderings. Only casually did it finally become known that Scotty's "gold mine" was A.M. Johnson, a Chicago millionaire, who furnished the cash for Scotty's costly venture.

### The 1932 Situation

California's growing pains manifested themselves in the official figures which showed an increase in the assessed valuation of real property, urban and rural, from \$7,035,742,630 in 1925 to \$8,123,208,593 in 1928. The State's entire population in the official census of 1930 was given as 5,677,000, an increase of over 65 percent during the preceding decade. That year the State had 47 cities with a population of over 10,000, of which 23 had more than 20,000 residents.





Los Angeles, the largest city in the State, was listed as having a population of 1,238,048, an increase of 114.7 percent over that of 1920. Covering approximately 442 square miles, it had become the largest city in the world in point of acres, somewhat indicative perhaps of the thousands of city lot farms included within its corporate limits. Los Angeles man-made harbor of San Pedro was rated as one of the wonders of the commercial world.

In 1932, California had 13 of the nation's largest banks, the Giannini banking system alone (first called the Bank of Italy and later the Bank of America), having 279 branches in 1927 and resources of six hundred million dollars. Amadeo Peter Giannini, Italian-American, founder of this banking institution and formerly a small fruit store proprietor, opened his first small bank in 1904. A good friend of the land, Giannini had amassed a sufficiently large fortune by 1928 that he was able to make a gift to the University of California of one and one-half million dollars. His endowment was expended mainly for rural land use research, investigation and land betterment.

This great banking system was only one of California's big multi-million-dollar corporations owing their existence to the State's great natural resources. In 1929 the assets of the Standard Oil Company of California exceeded 600 million dollars. In 1932 the Pacific Gas and Electric Company assets had a tax valuation of \$574,621,000 and the Southern California Edison Company \$313,613,000. Incidentally, according to published figures, in 1932 on these valuations the Pacific Gas and Electric Company paid \$6,406.324, and the Southern California Edison Company \$2,997,136 in taxes. Farmers and orchardists with an aggregate property valuation of \$574,620,000 that same year paid \$10,630,448.50 in taxes, - somewhat indicative of the fact that gigantic combinations of capital could play a big part in dictating the volume of their contribution to the public treasury, while the thousands of little land users of every type were forced to pay the full tribute exacted by the law of the land.

In common with the urban centers of the country, rural California represented a polyglot of races - people of almost every nationality, tongue and creed. As an illustration of the typical American melting pot represented by California farmers, a check of foreign-born residents in the intensively-used agricultural county of Fresno showed that in 1930 there were 10,000 Russians, 9,800 Mexicans, 6,200 Italians, 4,400 Germans, 4,500 Armenians, 4,200 Danes and 5,300 Japanese out of a total approximate population of 136,000. Over the State generally Italians constituted the greatest number of foreign-born agriculturists.





It has been noted that both the lumbering and mining industries had greatly bettered the lot of their workers, to the material advantage of these industries themselves. The lot of the farm laborers in California, however, was little changed, as the approximate quarter of a million transient workers travelled from one place to another to fit the needs of handling the local crops. It was quite natural that white ~~Farm~~ laborers would sink still lower in the social scale and that owners and managers of the great farm factories would turn more and more to the more easily exploited and cheaper foreign labor.

The twenties witnessed a considerable influx of Filipinos to add to the racial mixture handling the products of California's soil. In 1923 approximately 2,250 of this type of farm laborers entered the State; in the year 1926 more than double that number came in, and by 1930 there were around 35,000 Filipino laborers working on California lands, mainly in the sugar beet and vegetable producing sections.

The influx of Mexican laborers was still greater. For years constituting the main source of seasonal farm labor in the Imperial Valley and the southern section of the State, they spread to other areas where large farms engaged in intensive agriculture were located. Big land owners were little concerned as to the means of entry of this type of cheap labor and large numbers who had illegally passed the international barrier were deported by the immigration authorities during the 1920-30 period. In spite of a strict border patrol, many Japanese and Chinese found entry to California via the Mexican route and once over the border and intermingled with the other thousands of their countrymen, any weeding out of these trespassing laborers was an almost impossible process.

More and more the wily Japs usurped California agricultural land use and a combination of political expediency and large farming ventures was powerful enough to drown the cries of American labor raised against this aggression. The Japs were good farmers. They not only made money for themselves from the choice lands which they owned thru the medium of their American-born compatriots, but also produced handsome profits for land owners who found it much easire to lease their lands to the Jap farmers than to work the lands themselves. The Japs were invariably independent farmers - not hired farm laborers - and as their agricultural activities increased legal relief seemed impossible to obtain. Legislators from points away from the Pacific Coast consistently refused to recognize more than a minor problem in Japanese occupancy of California farm lands.



In 1925 there were between 17,000 and 18,000 Japanese engaged in agriculture in California, representing a tremendous production capacity. Gradually their numbers increased also in the coastal fishing industry, and they were equally as good fishermen as they were farmers. By 1926 approximately one-third of the commercial fishermen were Japanese.

When depression conditions struck the California countryside in the beginning of the thirties, the farm laborers of California were in a bad way and in this class may also be included the white tenant, or share-cropping farmer. The Japanese, with their native clannishness and their low standards of living, suffered little. The same may be said of the equally clannish Chinese, as well as the Filipinos and other Orientals also used to lower living standards.

Barring migrants of later years, the improvident, easy-going Mexicans of the peon class, having since American conquest been a fixed part and parcel of rural life in many parts of the State, were generally accepted by Californians as a local responsibility. A few of the better class had actually raised themselves above the status of the seasonal farm laborer and were beginning to be found among the artisan class, invariably in rural communities, for it is hard to divorce California-Mexicans from the soil.

The small, independent farmer, often burdened with a mortgage on high-priced land, was hard hit when the depression years of the early 1930's came. During the greatly augmented production of World War No. 1 debts soared and credit was easy, and these conditions continued to a large extent during the post-war boom years. Discarding the standby horses for which feed was furnished by the products of his farm, the farmer plunged heavily into the purchase of modern gasoline-propelled farm machinery, thereby adding to his burden of debt. Every \$100 in interest the California farmer was paying on his mortgage in 1914 had grown to \$237 in 1923, and his taxes were approximately double those of ten years previously. As demand for farm products sank to a new low his gross income dropped and in 1932 was only 45 percent of that of the 1929 level. Farm relief in California became as much of a burning issue as in many other parts of the richest nation in the world.

And even preceding the great Dust Bowl migrant rush thousands of people came to California rural lands seeking a panacea for their troubles. Leading newspapers of the country carried such glowing advertisements as the following: "One acre will produce independence, immediate income and permanent prosperity in glorious California. Write for particulars." And such particulars were set forth in profusely illustrated literature which, while it did not so greatly exaggerate the potentialities of California land,





failed to mention the fact that there were already too many people there to fit the existing economic conditions or that while the land might produce the crops, the harvest obtained was often a drag on the market.

California, with her environment of sunshine and winter roses, her paved highways, her modern luxuries of gas, electricity, telephone and radio to raise the standard of rural living; California with her tremendous potential production of the field, forest and mine, had fallen on evil days - the darkest she had yet known. The trite expression that the darkest hour comes before the dawn could well be applied to the California cowman, orchardist, miner and lumberman in that black depression year of 1932.

The dark cloud of depression, however, did have somewhat of a silver lining since in addition to the lessons learned during the hectic gold rush days, the eras of cattle and wheat empires, the period of large scale land abuse by roving shepherds, and the current intensified agricultural age with its insatiable demand for water, there was added the knowledge that the days of independent, go-as-you-please land use were gone forever.



## CHAPTER XIII LOW TIDE IN RURAL PROSPERITY - DAWNING HOPES - 1933-1941.

### Dark Days

There can be little argument against the fact that when Franklin D. Roosevelt grasped the helm of the ship of State as the thirty-second president of the United States of America he assumed one of the most stupendous tasks which ever faced a chief executive - a task which continued to grow in volume during the following years. Even his bitterest political opponents, characterizing many of his New Deal policies as fantastic and ruinous to the national welfare, were later won to admiration for his determination and courage.

Rural California was suffering from all the economic ills common to the rest of the nation when the second great Roosevelt assumed office. Banks by the score had crashed or were crashing; farmers were unable to sell their products; sawmills were standing idle; mines were shut down, and thousands of rural workers, laborer and small landed proprietor alike, were eating the bread of idleness, such sustenance more likely than not coming in whole or part from the nearest public relief agency.

Like his illustrious predecessor in office of the same name, Franklin Delano Roosevelt was a statesman and politician by vocation, but farmer and forester by avocation. Land and the products thereof had a real meaning for the new head of the nation and many of the first moves which his New Deal policies directed towards the task of lifting the country out of the slough of depression had to do with conservative practices of land use designed to halt and perhaps cure the abuses of several generations.

If some of the land-using policies brought into being failed to stand up to the final test, it was not thru any lack of intent on the part of the nation's chief for rejuvenation of a sadly harried land, but rather that some of the desperate measures applied to cure a desperate disease did not fit in the life of a democracy, the underlying principle of which was that each citizen was as equally free and independent as his neighbor.

As has been stated, this is not a political history, yet in passing, mention can hardly be avoided of the California situation at the beginning of this period when hundreds of thousands of Californians grasped at straws, in their gropings to bring back the patch-work prosperity which had always existed in the economic urban and rural life of the State. In fact, even during the worst years of the depression, this patchwork of prosperity and poverty was much in evidence - a spectacle of thousands subsisting only on the bounty of the public purse gazing with envious eyes on millionaires, near millionaires, and moderately rich industrial and land barons living in the lap of luxury.



While his Utopian plans did not materialize in greater prosperity for the downtrodden as did the more practical plans of the Nation's chief executive, there is no doubt that Upton Sinclair's theories of land use left their impress on California life.

Sinclair, a great writer, an ardent Socialist and always a champion of the underdog, was swept into the vortex of State politics on the wings of the national depression. Running twice for State governor and once for United States senator, Sinclair made his most spectacular campaign for the office of California's chief executive on a platform called EPIC. This stood for the slogan, "End Poverty in California," parodized by his political opponents as "Extend Poverty in California," "Empty Promises in California" or "End California in Poverty." His proposed plan of government involved the purchase of idle land and growing crops on them thru a State-controlled bureau. His scheme included gigantic cooperatives operating on a Statewide basis, whereby land users and urban processors of land products were combined in one grand, State-controlled league.

Sinclair stepped into California's political arena at an opportune time. That he threw a real scare into monopolists and big land-owners is attested by the bitterness of the campaign waged against him. Altho defeated in the gubernatorial race, he polled 879,000 votes out of a total of 2,319,000 in the 1933 State election.

Sinclair promised a lasting prosperity to the State in his plan to take over the land, the industries, and the banks, and place them in the hands of the people. Three of his Twelve Principles of Epic are well worth repeating. Number One stated: "God created the natural wealth of the earth for the use of all men, not of a few." Number Five read: "Where some men live without working, other men are working without living." Number Six set forth - "The existence of luxury in the presence of poverty and destitution is contrary to good morals and sound public policy." While Sinclair's plan smacked too much of outright Communism to be taken over in its entirety by the people of California, many of its humanitarian factors were embodied in the principles of the nation's chief. And while Sinclair was a failure politically, his memory will always live as a great writer on social and economic problems.

Rural California in 1933 surely needed some form of economic stimulant. That year the extractive industries of the State - products of the land - were valued in their raw condition at \$677,790,000, just about half of the peak figure of 1929, which was \$1,304,029,000. This had risen in 1935 during the gradual process of industrial recovery to \$879,416,000, still far short of the peak figure. In the latter year, however, California's great motion picture industry production costs had reached a figure of \$165,065,000, close to one-fifth the monetary value of all raw materials produced from the farm, forest and mine. As an anomaly,





perhaps, in 1933, out of 63,000 rural families in 12 of the leading agricultural counties, 3,478 were on relief rolls.

A survey made in 1934 by the Works Progress Administration covering 150,360 active California farmers, showed that 26,121 or 17.4 percent, each worked 150 days or more off their farms, mostly on work relief projects. Around the peak period of work relief in rural areas, in June 1935, there were 21,000 relief roll workers in the open country, involving 138,000 people, and in addition 15,000 on work relief projects in villages throughout the State. These figures are over and above many thousands receiving direct relief from the State or county on an outright charity basis.

One does not usually associate farmers and rural residents with matters having such an urban complex as destitution, relief rolls and labor strikes, yet between April and December 1933, there were 37 strikes in California, involving 48,000 farm workers. Cotton pickers, grape pickers, vegetable harvesters and other rural workers broke out in sometimes armed rebellion as the owners of the large farm factories took advantage of general economic conditions to force the wages of transient laborers down to a new low. Several lives were lost in clashes between striking farm workers and police officers during that year of 1933. Many of the peace officers were themselves rancher-employers, deputized to deal with the farm laborers and thus often able to dictate their own terms of wages and employment. A group of over 2,000 transient laborers were rounded up at one time in the San Joaquin Valley and placed in a concentration camp.

### A New Type of Emigrants

Misuse of land further to the east with the resultant Dust Bowl conditions now so generally known and which brought thousands of people to the Pacific Coast, tremendously increased the unemployment problem in rural California. This class of settlers was never welcome, yet most of them represented the best type of American farmer, fallen on evil days because the soil of the Western states in which they had firmly planted their roots for three generations would no longer support them. They were basically the same American pioneer stock who had braved the dangers of the emigrant trails, carved out homes and built cities in the vast empire west of the Mississippi. Regardless of the state of their origin, they were contemptuously referred to as "Okies," mainly because Oklahoma was the center of the great agricultural basin so much of the soil of which had gone with the wind.

In their battered flivvers, most of these emigrants arrived in California almost penniless, storming the doors of relief agencies or seeking employment in the fields and orchards. In 1933, the



Federal government alone was taking care of 20,000 of these people. In an attempt to stem the tide regular forts were established at the State's borders and unless a family had a certain amount of cash it was turned back. Hitch-hikers trying to enter the State were arrested for vagrancy. It cost California about a million dollars to return some 82,000 of these migrants to their places of legal residence.

Relief rolls of some of the Great Valley counties increased over 400 percent as State, county and municipal relief agencies endeavored to cope with this burden of indigents thrust upon California by her sister states. Between August and October 1934, some 70,000 of these homeless wanderers entered the State. It is estimated that during the entire period of the 1930's, altogether 1,200,000 migrants entered California.

To harvest the 1935 crops of all California a total of 216,000 transient workers were needed at different periods of the year, never over 150,000 at one time and that during the harvesting peak. There were already 100,000 available, but 200,000 more came in that year. The influx of migrant penniless, or near-penniless workers, continued almost to the end of 1940. Nearly every town of any size had its collection of shacks usually known by the name of "Little Oklahoma."

Some few of the migrants from the Dust Bowl area had saved a little money from the wreckage of their family land and home. This did not go far at prevailing California land prices but the avidity with which these forced emigrants invested their little all in a fragment of California land was indicative of their faith in the Pacific Coast Commonwealth and their determination to become rooted in the new soil.

There were always unscrupulous speculators ready to take advantage of such factors. One Los Angeles suburban mushroom community was opened up on bare land in 1935, the promoters advertising the tiny tracts as "garden farms." These sold for \$200 to \$275 each, on the basis of a few dollars down and a few dollars a month. Inhabited almost exclusively by transients, some of these microscopic land holdings were sold over and over again as prior purchasers failed to meet their installment payments. By 1940 this subdivision had a population of 26,000, living mostly in filth and squalor - no self-government, no sewer facilities and no police or fire protection. It can be truthfully said by those with any intimate knowledge of California conditions among these migrant settlers that John Steinbeck's famous novel, *Grapes of Wrath*, presented a picture but little overdrawn.





One can hardly criticize the Dust Bowl and kindred migrants. All of their lives they had heard of the glories of California soil and climate, a climate where a hardy, penniless American Family could live mostly outdoors under a tattered canvas, or soil on which an ambitious family group with modest means could wrest a livelihood from an acre or two of the fertile land. And then too, there were thousands of Japs earning handsome returns from California lands on which Americans could hardly fail to do the same. Nor can one censure too strongly the attitude of Californians towards these Dust Bowl migrants. Their own State suffering from the nation-wide depression, they could hardly be expected to welcome with open arms hordes of new people to add to the staggering relief load they were already carrying.

### Farms and Farm Crops

One notes that California land advertising of the middle and late 1930's was mainly directed to a class of people having money to spend - the tourist class, retired farmers and business men, and people with an income and the ability to buy land, merchandise or service. So the class of people of moderate means continued to increase in numbers in California, helping to build up the population of urban-rural communities where many of them have tiny orchards or intensively-cultivated small farms.

Altho most of these "urban farms" are not dignified by the U. S. Bureau of the Census as bona fide agricultural ventures, their crops serve to swell the agricultural production of the State. In 1935, the Federal authority listed a total of 150,360 regular farms in California, containing 30,438,000 acres, the average-sized farm unit consisting of 202 acres, with an average value of \$15,466. The average valuation of all farm land was \$76.40 per acre. Five years later the number of individual farm units had dropped to 132,650, the average acreage per farm increased to 230 and the average value per farm unit to \$16,331. During the five years, however, the average value per acre had dropped to \$70.97.

These figures prove that a lot of submarginal land had gone out of circulation as independent farm units, and the additional fact that California was still an undisputed leader among the states in big land holdings. Statisticians, generally, concede that California leads all states in large scale farming operations both from the standpoint of large acreages and production volume. Big agricultural ventures are characterized by two leading contemporary writers respectively as "The Capitalistic Type of Farming" and "Factories in the Fields."



The total population of California in 1940 is given officially as 6,907,000, this increase of 21.7 percent over 1930 placing it in the lead among all States in rate of population growth. The increase in rural population during this decade was 31.2 percent in the eleven southernmost counties and in the other 47 counties, approximately 22 percent. The total farm population increased from 608,838 in 1935 to 635,019 in 1940. The census figures state that during the peak of employment in 1939 the number of working farm laborers was 210,599, and that the cash wages paid to farm laborers that year totalled \$114,123,135.

In 1936 California again jumped into billion-dollar production in the extractive industries, as the industrial depression was gradually being shaken off and European pre-war demands began to be felt. The State Chamber of Commerce figures show the following for the cash farm or basic plant production value, the processing of products each year approximately doubling the raw material value:

VALUE OF CALIFORNIA EXTRACTIVE INDUSTRIES.  
(Expressed in Thousands of Dollars)

Year	Agriculture	Mining	Lumbering	Fisheries	Total
1936	\$ 656,960	\$ 327,804	\$ 49,047	\$ 17,286	\$ 1,051,097
1939	625,380	352,463	53,312	18,555	1,049,710
1941	870,900	374,326	80,900	23,000	1,349,126

The values of farm products are further broken down to show the approximate 871-million dollar production of 1941 as; fruit and nuts, 297 million dollars; vegetables, 144 million; meat animals, 115 million; dairy products, 114 million; poultry and eggs, 61 million; field and all other crops, 140 million.

To meet the crystallizing wartime demands, sheep and lambs on California farms and ranges increased in number from 2,990,000 in 1939 to 3,006,000 in 1942; dairy cattle from 700,000 to 786,000; all other cattle and calves from 1,600,000 to 1,729,000, while horses dropped in numbers from 182,000 in 1939 to 170,000 in 1942 and mules from 30,000 to 23,000.



The hog population on California farms jumped from a figure of 790,000 in 1939 to 894,000 in 1942, chickens in number from 15,136,000 to 16,484,000, and turkeys from 1,141,000 to 1,260,000. The statisticians placed the value of livestock and poultry on California farms in 1939 at \$163,142,000; in 1942 at \$240,370,000.

In 1941 California farmers produced 203,680,000 pounds of butter fat and marketed 142,667,000 dozens of eggs. That year 352,000 acres of cotton produced 470,000 bales; 76,000 acres of potatoes yielded 21,805,000 bushels; 1,908,000 tons of sugar beets were harvested from 132,000 acres; the production of alfalfa hay from 765,000 acres was 3,366,000 tons and of grain hay 1,136,000 tons from 710,000 acres. In that same last year of national peace, all other kinds of tame hay grown on 1,659,000 acres of California land resulted in a crop of 4,795,000 tons.

In one crop summary showing farm income for the years concerned as 675 million dollars in 1940 and 878 million in 1941, there is listed almost 22 million dollars as Federal government subsidy payments in 1940, with a drop to approximately 18 million dollars the following year.

California's diversity in fruit and nut production is well illustrated in a check made in 1938 when it was shown that of the sixteen leading nut and fruit crops of the nation she led the 48 states in all but two - apples, where she held fifth place among the states, and grapefruit where her rank was fourth. This detailed survey showed that of the total national production, California produced 93% of the grapes; 99% of the almonds; 40% of the peaches; 97% of the figs; 99% of the plums and prunes; 85% of the apricots; 36% of the pears; 21% of the cherries; 90% of the English walnuts; 54% of the oranges; 85% of the avocados; 95% of the dates, and practically all of the lemons. Singularly enough, California marketed her navel oranges in 1940 at an average price of fifty cents more a box than was brought in by the oranges of the great citrus state of Florida.

In the census of 1940 among the ten leading agricultural counties of the United States, California climbed further up the list in county unit production valuation with Los Angeles county again taking first place in the nation, Tulare county second, Fresno county third, and San Joaquin county fourth. The wide range of geographic location and climatic conditions of the other six of the ten leading agricultural counties of the United States is indicated by the fact that Lancaster, Pennsylvania ranked fifth; Arrostook, Maine, sixth; Wild, Colorado, seventh; Maricopa, Arizona, eighth; King, Washington, ninth; and Yakima, Washington, tenth.





In the matter of cereal field crops, California in 1940 continued to show its diversified farming adaptability. Figures that year credited the State with the production of 2,240,000 bushels of corn; 11,370,000 bushels of wheat; 33,516,000 bushels of barley; 8,968,000 bushels of rice; 4,350,000 bushels of oats; 2,814,000 bushels of flax; 4,704,000 bushels of sorghum, and 5,592,000 bags of beans.

In 1941, the total area of all field crops in the State was 5,369,600 acres; the harvest, 9,630,190 tons of produce; its aggregate farm value \$215,861,000. The average value per ton of all field produce was \$22.42 and as will be seen from these same condensed figures, the average gross return per acre was \$40.20. As a basis of comparison the average gross money return per acre on a very much smaller crop volume was \$17.75 in 1932; \$34.86 in 1937, and \$31.34 in 1940. The average value per ton of these mountains of forage and foodstuffs produced was \$10.20 in 1932; \$20.15 in 1937, and \$15.53 in 1940.

Specialty crops continued to mark California's diversified agriculture. The 1940 report of the Bureau of the Census shows 1,532 farms producing horticultural specialties to the value of \$10,995,352 and 345 farms growing forest products to the value of \$379,324. Tropical fruits, flower and vegetable seeds, domestically-produced furs, cut flowers shipped throughout the nation, and rare fruits and berries combined to swell the total of almost 200 agricultural crops, commercially produced in the versatile California climate.

Giant chrysanthemums, introduced from Japan early in the century, with the production center on a relatively small acreage in San Mateo county, accounted for an eight-million dollar business in 1935, when 600 refrigerator cars were needed to distribute the showy blossoms throughout the nation. Fruit juices and concentrates, utilizing fruits which might otherwise be wasted, commanded a premium in the world's market. Tomato juice, practically unknown in 1930, topped the market in California fruit and vegetable juice production in 1940. Rare quality dates grown in the Coachella Valley brought as high as five cents for a single date.

Unique, perhaps in land utilization, was the rehabilitation of rundown soil by dairy farmers in Humboldt county. Eureka whalers, after processing the giant sea mammals to secure the closest possible utilization, still had a problem of thousands of tons of waste material on their hands. The farmers hauled these desicated whale carcasses to their farms and spread them over their rundown soil where the odoriferous material proved to be the most efficient of soil restorers.



Experiments in flaxseed production made in the Imperial Valley in 1927 were so successful that by 1935 that section was harvesting 23,500 acres of flax and other counties, mainly San Joaquin, 14,500 acres more. In 1939 the State's flax acreage had increased to 108,000, the seed production was 1,728,000 bushels and the average yield per acre was 16 bushels, as against the national average of 7.6 bushels per acre.

It was also found by analysis that the oil content of the California flaxseed was five to eight percent higher than that grown elsewhere. An agricultural product usually associated with severer climates, flax has proven itself a valuable California crop. It is harvested by combines. After the extraction of the oil, which has a multitude of uses, the residue seed makes excellent stock feed. The straw is baled and marketed for rough fiber uses.

It can scarcely be said that the rabbit industry represents a major use of California lands, yet in production value - meat, fur and wool - it ranks among the leading livestock ventures of the State and on account of the small land space usually occupied is probably the most concentrated. A backyard industry, and the meat to a great extent marketed over backyard fences, even the best informed can make only a crude guess of the total State volume. In connection with a study of the venture, initiated by the Agricultural Extension Service in 1930, L. D. Sanborn, Assistant Farm Advisor for Los Angeles County, remarked, "In Los Angeles county, which probably produces more domestic rabbits than any other county in the United States, the rabbit-raising industry is still in the backyard stage."

Around 1941, one investigator went so far as to credit rabbit-raising with third place in California livestock undertakings in the matter of production value, putting it in a class with dairying, beef-raising and hog production. Altho this is probably a decidedly exaggerated viewpoint, some idea of the volume of rabbit production may be gained from the fact that altho California is a leading rabbit production center, 200 to 250 tons of rabbit meat were imported into the State annually during the middle thirties and that the average annual United States imports of undressed rabbit pelts 1936 to 1939, inclusive, amounted to almost 91 million pounds, valued at approximately \$13,965,000 per year.

The Agricultural Extension Service studies on rabbit raising in Southern California were carried on from 1930 to 1940 and covered 70 rabbitries, involving some 4,000 breeding does. It was found that while one man under ordinary circumstances and by working nine hours a day could care for a rabbit farm involving 200 breeding does, the unit income would not provide a comfortable family





living, but that as a side line it was quite profitable. It was found that the investment per breeding doe over a ten-year period, including land, buildings, breeding stock and equipment, ranged from a high of \$15.00 to a low of \$12.81.

The net profit, to compensate the rabbit raiser for his labor, ran as low as an average of \$2.72 per breeding doe, the highest average annual figure during the 10-year period being \$4.96. The studies showed that the average adult doe rabbit produced at least 50 pounds of palatable meat per year, and cost an average of \$3.50 to \$3.75 to feed herself and her offspring sold for table meat.

The most common breeds of rabbits raised in California were the New Zealand Reds and Whites, the white and Grey Flemish Giant and Chinchillas, all raised for the dual purpose of meat and fur; the Checker Giant and Belgian Hare, raised for meat only, and the Angora rabbit, produced mainly for its wool.

From the dual purpose breeds there are three sources of revenue, meat, fur and manure. The last, highly valued as fertilizer, brought in \$12 to \$15 per ton. Meat, sold retail, largely from the hutch to the consumer passing by, averaged 40.5 cents per pound between 1931 and 1941. However, lest a minimized idea of the volume of rabbit meat be gained, let it be said that in the city of Los Angeles alone during the early 1940's some 50,000 pounds of rabbit meat were sold weekly over the butcher shop counters, this<sup>in</sup> addition to backyard sales.

There is such a wide variation in rabbit fur that it is almost impossible to give any average price figure. The best grades, for which 50 cents to \$1.00 per pelt might be secured are found in leading furrier stores in the form of fur coats to tempt milady's fancy, under a camouflaged name, with a price tag running into three figures attached to the finished garment. The other extreme is rabbit skins sold to hatters and for processing into the cheaper fur garments at a price of a few cents per pelt. Statisticians venture the estimate that the furs from the offspring of an average breeding doe do not bring in a total revenue of much more than fifty cents per annum.

The exception in the rabbit fur field was found to be the Chinchilla species. Some of the varieties of this breed in addition to being fur-bearers, produced very palatable meat, while others were raised exclusively for their rich, lustrous fur. The investment required for the rabbit raiser who specialized in fur rabbits was greater, but his income was greater also. Such names as Sealine and Beaverette, used in the furrier trade, are somewhat indicative of the resemblance the best rabbit fur bears to leading fur-bearers of the wilds. French Sable, Northern Seal and Meskin Ermine all once adorned the backs of the best Rex Chinchilla fur rabbits, and some few California farmers were building up a good business in the production of high grade fur.



A new type of rabbit farming came into vogue during the 1930's, one which really paid a fair wage to the breeder of the strain. The Angora rabbit, altho its meat is also palatable and tasty, is produced chiefly for its fine texture wool. Rabbit wool had been known to the woolen trade, chiefly for foreign export, for quite some time and was used mainly in the manufacture of high-priced sports clothes.

Mr. and Mrs. F. G. Woodford, of Inglewood, formerly in the livestock business, decided to try city life for a while. Not willing to lose contact with the soil entirely, they purchased a suburban farm near Inglewood and secured a few Angora rabbits as pets. Mrs. Woodford clipped the long, silky wool from their backyard livestock and knowing nothing about markets, purchased an old spinning wheel on which she spun the wool into yarn. Knitting the yarn into sweaters and other winter clothing for Christmas gifts, the homemade garments made such a hit that the couple decided to go into wool rabbit farming. By 1941 they had over 1,000 Angora rabbits on their place and did so well in the business that others in their locality took it up. It was found that with an acre or so of land and a strictly modern rabbit plant a man and wife could care for 750 animals and make a comfortable livelihood. One woman refugee from the European war zone, went into the business and spinning her own wool, made quite a financial success on a small scale.

The average Angora rabbit will produce 12 to 14 ounces of fine texture wool per year. Males are clipped five times annually, females four. Clippers cut the wool too closely and the bunnies take cold, so ordinary barber shears are used in the shearing process. An experienced person can clip the fleece from a rabbit in six to ten minutes, altho a novice might take two hours.

With a ready market waiting, the average price per pound for rabbit wool during the late 1930's was \$5.43. The price in 1939 was \$5.72. As a basis of comparison, the average sheep, clipped once a year, produces around eight or nine pounds of wool with a market price of one-tenth, or less, than that commanded by the rabbit variety. In favor of this type of rabbit farming, it may be said that meat production being a minor consideration, much less feed is required for the wool-bearing bunnies than for the straight meat breeds.

### Los Angeles

Not only did the Los Angeles county lead California and probably the nation in rabbit farming ventures but as has been stated, was the leading agricultural county as well. Depression years



notwithstanding, southern California, with Los Angeles as the hub, continued the phenomenal population and production growth which amazed the world. Metropolitan Los Angeles was credited with a population of 1,625,000 at the end of 1941. The population of the county at the same time was officially estimated at 2,942,000, some forty percent of the entire number of people living in California.

Of the 2,605,440 acres comprising Los Angeles county, 452,382 acres were included within the corporate limits of 44 incorporated cities. A total of 944,266 acres was publicly-owned, 645,045 acres of such being included within the adjacent national forest. The 1940 Federal census listed 12,475 farms in Los Angeles county in which were included 596,552 acres. Only 159,700 acres of this total farm area was irrigated. The average value of land with improvements on small farms of less than ten acres was \$1,898 per acre and in the next larger edition of ranches ranging from 10 to 29 acres in size, \$1,073 per acre.

The Los Angeles County Chamber of Commerce gave the 1941 agricultural production for the county as \$113,796,500, roughly divided into fruit and nuts, 32 million; truck crops, 14 million; field crops, 18 million, and livestock and poultry, 49 million dollars.

There is no commercial timber worthy of the name in southern California but mineral production in Los Angeles county alone for 1941 accounted for almost one-fourth of the entire State output. In 1938, a peak year, 105,729,000 barrels of crude oil were pumped from the earth in that county.

With the immense oil production in Los Angeles and other Southern California counties, the man-made seaport of Los Angeles had become the great ocean shipping center of the State, swapping place with the immense natural harbor of San Francisco. Whereas in 1905, San Pedro, (Los Angeles harbor), recorded the arrival of 144 ships and an ocean freightage of 922,378 tons, records for the same year show the arrival at San Francisco harbor of 5,545 ships, and freight movements of 5,292,113 tons.

In 1940, Los Angeles acclaimed the arrival of 5,598 ships at her port and a shipping volume of 19,939, 057 tons, while San Francisco that year noted the arrival of 4,167 ships and ocean freightage of 7,118,568 tons. It is a sad commentary on our lack of foresight that most of the oil shipments which formed the bulk of southern California's outgoing ocean freight were destined for Japanese ports.





Taking Southern California as a whole, the ten counties usually considered as comprising this division of the State produced in 1941 agricultural crops to the value of \$396,946,000. The total population of this area, lying south of the north boundaries of San Luis Obispo, Kern and San Bernardino counties, was estimated at 3,849,700, of which some two million people lived in rural districts or in towns of 2,500 or less population. In this area of the State 36 agricultural crops, each having an individual value of more than one million dollars, were harvested that year.

### Water and Climate

The misgivings of large numbers of Los Angeles citizens that Owens Valley water was insufficient for the area's needs spread to many others and Los Angeles was not slow to put in her bid for a large share of Boulder Dam water, to be used in common with sister cities included in the Metropolitan Water District. Los Angeles' growing water needs can be briefly stated as having been met in three phases of development; first, from the days of Spanish colonization to the first decade of the 20th century, by local water from the surrounding hills; second, from 1910 to 1935, by Owens Valley water brought in from 225 miles distant, and third, by water from the Colorado River, brought thru the great aqueduct built following the construction of Boulder Dam.

During the period 1933 to the present time, water development in California and for California lands involved such gigantic projects that all previous development is dwarfed by comparison. In the foregoing pages it has been brought out that that indisputable Federal authority, the Bureau of the Census, in 1930 listed some eight million acres in the State possibly irrigable by existent projects, or somewhat over one-third of the actual and potential farm lands. Their figures showed also that water was then available for 6,815,000 acres and only 4,746,000 acres were actually being supplied with water.

There was no question of the need for harnessing and utilizing the mighty Colorado, draining approximately one-third of the area of the entire United States, since these waters were more logically contingent to the southern California lands than the State's own waters lying north of the Tehachapi barrier. Work was, therefore, started on Boulder Dam, the greatest irrigation project up to that time ever undertaken by man, in May 1931, and the project accepted as completed by the United States Bureau of Reclamation in the fall of 1936.

To fulfill Boulder Dam's four major purposes of water storage, flood control, silt control, irrigation, and generation of electrical energy, contractors at a cost of 165 million dollars built



the highest dam in the world, towering 727 feet high in the Black Canyon of the Colorado. Lake Meade, as the resultant storage reservoir is called, is 115 miles long, 585 feet deep, with a storage capacity of 30,500,000 acre-feet of water, by far the largest artificial lake in the world. This man-made lake contains sufficient water to cover the entire state of Connecticut ten feet deep or to supply 5,000 gallons to every man, woman and child on the face of the earth. Of the stored water not held perpetually in reserve, the Los Angeles area was allotted 3,357,000 acre-feet and the Republic of Mexico 2,148,000 acre-feet. The balance of the water went to the Imperial Valley and surrounding desert basin areas.

The Boulder Dam project not only relieved the flood hazard constantly threatening Imperial Valley, but made possible the completion of the great All-American Canal by private enterprise at a cost of almost 40 million dollars, and which delivers Colorado River water to 400,000 acres of former desert lands. These lands by 1940 were worth 100 million dollars and provided homes for 60,000 people. Theodore Roosevelt's prediction relative to the great Colorado desert lands had come true.

Other purposes of the great project had been accomplished also. Where formerly the Colorado River flowed thru Black Canyon carrying 300 tons of silt a minute, its dark brown current almost a liquid mud, the water was now a clear, deep, sparkling blue. The scenic Lake Meade, stretching for miles behind the gigantic dam in Black Canyon, provided a national recreation center, its waters now stocked with millions of game fish. Millions of watts of electric power were being carried over hundreds of miles of desert thru cables strung on massive 100-foot steel towers to the almost limitless market of the southern California Coastal Region, these electrical transmission lines in themselves representing a 24-million dollar project. The electrical power generated by Boulder Dam was sold to different commercial companies, 36 percent going to Arizona and Nevada consumers and 64 percent to southern California.

Water impounded by the Boulder Dam, however, was some 400 miles from Los Angeles and the Southern California Coastal Plain and to deliver the water meant crossing almost insurmountable desert and mountain terrain. This factor gave birth to the Great Aqueduct, a project greater in its scope even than Boulder Dam itself. The Boulder Dam was an interstate and international project - the Great Aqueduct purely a California venture, based on the urgent need of water for California lands.





In the midst of the great national depression, southern Californians, expressing themselves thru their Metropolitan Water District by a five to one vote on September 29, 1931 authorized a 220-million dollar bond issue to finance the cost of bringing Colorado River water to the thirsty California Coastal Plain. This involved the construction of Parker Dam, 150 miles downstream from Boulder Dam, in itself an immense reservoir project. It involved the building of numerous smaller reservoirs, miles of huge tunnels thru mountain spurs, immense canals, pumping stations and almost fantastic water development installations.

The Metropolitan Water District which visualized, engineered and completed the task of bringing water approximately 350 miles from the Colorado River to the extreme western edge of the southern California Coast Region, in spite of its citified-sounding name, renders a mixed urban and rural water service. Its territory includes the fertile plain surrounding the city of Los Angeles, extending westerly to the Pacific waters, to Redlands on the east, Newport Beach on the south and to the mountain barrier on the north. It includes within its orbit 13 incorporated cities, a land area of 1,408,000 acres, and a population of approximately three million people. The district, organized in 1928 under the State law of the previous year, buys and sells real estate, borrows money, levies taxes and has the power of eminent domain. A non-profit organization, its chief business is to sell water at cost to land owners and urban users within its territory.

Although surveys for the Great Aqueduct were commenced in pre-Boulder Dam days - as early as 1923, in fact - active construction of the project was not well started until 1934, and generally completed in 1939. The work was financed thru the Reconstruction Finance Corporation and later thru the Public Works Administration. Parker Dam construction, marking the intake at the Colorado River end, was started in the summer of 1934. While the cost of the Parker Dam itself is paid for by irrigators, title to the dam is vested in the Federal government. Half of the power generated by Parker Dam is used by the Metropolitan Water District and half by the Federal government. From the Parker Dam intake to the western terminus of the main aqueduct the median distance is 340 miles. The actual length of the main aqueduct is 242 miles but main distribution lines add a mileage of 176.

In this 242 miles of main aqueduct there are 29 tunnels, 16 feet high and 19 feet wide, ranging from 338 feet to 96,605 feet in length, the total length of these main tunnels being slightly over 92 miles. Concrete lined canals, 20 feet wide on the bottom and ten feet deep, carry the main water flow 62.8 miles. Covered conduits, the same approximate size as the tunnels, convey the water



54.4 miles. Giant siphons push the water along its course for 28.7 miles. The remaining four miles of the great water transmission project is taken up by reservoirs and pumping plants with only slightly over one mile of unlined canal which traverses an unbreakable rock formation.

The great Boulder Dam, the All-American Canal and the Great Aqueduct, taken all together, represent a publicly-owned and private enterprise irrigation network possible only, perhaps, in connection with the use of high-producing, highly developed California lands. From the standpoint of the public purse, the entire system is a good investment, since cost of its construction will eventually be paid by the land user and the urban consumer of water and electric energy. And Southern California had provided for the water needs of five or six million more people yet expected to locate in its much "boomed" climate.

Even while hard times beset California farmers during the upset thirties, good progress marked the official irrigation districts organized and operating thruout the State under the Wright Act. The year of 1941 produced a large amount of legislation affecting the Irrigation District Act. This covered voting privileges, levying of water assessments, handling of lands and similar matters intended to strengthen the business methods of farmer-irrigators.

The report of State Engineer Edward Hyatt covering operation of the official districts for 1940 showed a total of 95 districts covering a gross area of 3,500,413 acres, of which 2,903,360 acres was irrigable. The assessed cost of water to the users that year was \$2,744,022. Tax delinquent lands within the districts in 1940 totalled 340,263 acres, besides 27,643 acres which were acquired and resold by the districts during the year. In these 95 districts the total crop area that year was 2,003,657 acres of which 314,800 acres were double-cropped, hence counted twice in the crop acreage figure. The actual irrigated area within the districts was 1,688,857 acres, 156,134 additional acres being dry-farmed to produce mainly grain and grain hay.

These Wright Act districts in 1940 operated 21 major storage reservoirs with a combined capacity of 1,097,000 acre-feet of water. The total amount of water diverted by all districts that year was 8,559,600 acre-feet of which 87 percent was obtained by gravity flow, 9 percent by pumping from streams and 4 percent thru pumping from district wells. The districts in 1940 operated 629 wells for irrigation or drainage, and 213 other pumping plants.



The official State irrigation districts of California, in the aggregate, represented big business. Although the great Wright Act had been so amended and supplemented that the original law could scarcely be recognized, the fundamental democratic principles on which it was based were fully retained. Districts were in effect rural cooperatives, and in spite of State direction and supervision in the technical details, were essentially examples of free enterprise, their internal affairs locally managed by the land owners and water users. That the districts were financially sound is indicated by the figures given in the 1941 official report.

As of January 1, 1941, 73 of the districts were listed as having issued \$80,130,145 in original securities and \$36,419,675 in re-funding bonds. The total bonds sold or exchanged amounted to \$101,238,744, of which \$11,748,406 had been paid and \$89,397,338 were outstanding. All interest on R.F.C. loans made to the districts had been paid and the principal of the loans materially reduced. Loans outstanding on this date were shown on the State records to be \$18,919,832.

Eighty-one of the districts in 1940 held tax deeds covering 329,866 acres, but while tax sale certificates held on January 1, 1940 amounted to \$1,688,008, this figure had been reduced by January 1, 1941 to \$1,318,798. Receipts for 1940 of these 81 districts reporting to the State authority were \$13,844,819 while disbursements for the year totalled \$12,761,338. The same 81 districts had \$10,732,133 cash on hand on January 1, 1940 and \$11,853,615 on hand December 31, 1940.

The State report gives the all-inclusive population of the districts as 451,700 people, of whom 280,340 lived outside towns and cities.

When world War No. II came, work on the Sacramento and San Joaquin Drainage District, previously mentioned as having been created by the State Legislature in 1913, was about eighty percent complete. The official State Blue Book has the following comment to make on this project:

"A gigantic drainage and flood control agency, it envelops approximately 1,515,000 acres of land, lying within the borders of 14 counties; involving the construction of 660 miles of river levees and 122 miles of by-pass levees; the acquisition of 214,000 acres of flowing easements and of levee and construction rights of way; the clearing of 15,000 acres of timber and brush; the construction of five weirs and pumping plants. One hundred and forty separate reclamation districts are located within this master district."





California's peculiar geological structure which creates almost innumerable small valleys, naturally results in the fact of there being many irrigators who individually, or with a neighbor or two, own their own irrigation works outright and have indisputable water rights under the riparian law. Some farmers have never-failing springs rising on their own land. Thruout the State also in 1941, in addition to the regularly organized Wright Act districts, there were 68 county water districts operating, some of them of considerable magnitude.

The California State Railroad Commission records show 48 public utilities, large and small, selling water to land users in 1938. The total investment in irrigation enterprises by these private concerns, mainly selling water as a side issue to marketing electrical energy, was approximately seventeen and one-third million dollars that year.

Five of the largest concerns had a fixed capital investment in irrigation works of \$11,187,000. Some of the smaller utilities furnished water to irrigate but a few acres embraced in two or three small farms, others to irrigate scores of thousands of acres. Since the Railroad Commission checks on revenue rather than on irrigated area and the latter also greatly fluctuates from year to year, exact figures are difficult to obtain and the best estimate of the land area irrigated with water sold by public utilities in California in 1938 is around 300,000 acres.

Official State districts, county water districts and others interested in irrigation and drainage had a common meeting ground in the Mutual Association of Water Districts. First organized in 1910, by 1940 its membership included 100 different water and reclamation districts located in 35 counties of the State. Major problems of water use, efficient irrigation methods, water conservation and land use problems occupied the attention of the organization at its periodic meetings. Since in the aggregate these joint users represented investments in land and water projects running into hundreds of millions of dollars, State and Federal legislative bodies alike were interested in their recommendations.

California was justly exercised over her water problems, scattered among Federal, State, municipal, and private administration. California's population had grown from a density of 22 per square mile in 1920 to 36 in 1930, and to 44 in 1940. This, while far below that in many of the Eastern and Atlantic Seaboard states, made ever-increasing demands on the State's unevenly distributed and often poorly conserved water supply. Always in California there was the anomaly of too much water sometimes and at other times, too little.



In 1921, in the orange belt in rich Tulare county, farmers struck water at 35 to 120 feet and pumping operations were profitable. In 1933 they were forced to sink their wells to a depth of 60 to 220 feet and some of the wells were becoming salty. By 1936 some 20,000 acres of highly-developed land had been abandoned in this section and underground water was being overdrawn on 400,000 acres more.

In the rich Santa Clara Valley adjoining the San Francisco Bay Region, by 1934 the water level in wells had gone below sea level and had dropped an average of 116 feet in 20 years. Similar conditions existed in other agricultural areas of the State. In the rich delta region salt water was pushing its way into the irrigation canals as the channels of the two main streams of the State, the Sacramento and the San Joaquin, became more and more silt-choked, with a resultant weaker streamflow to push the salt water back where it belonged.

Winter floods were an ever present threat, particularly in Southern California where the urban growth had produced thousands and thousands of acres of roof tops, concrete streets and highways presenting a nonabsorbent surface to the torrential winter rains. The worst flood in more than half a century visited Southern California in 1938, extending from Santa Barbara county to the Mexican border and east to the Mojave Desert. In spite of the millions expended on flood control projects in the Los Angeles area, mainly on the lower reaches of streams rather than on the hillsides above, as the center of the flood disaster it was the hardest hit, with an estimated property damage of \$20,600,000.

The heavy rains lasted from February 27 to March 4, the peak of the rain and flood waters being reached on March 2. Some of the streams carried as much as seventy-five percent boulders and solid matter, mixed with the rolling waters. Through the city of San Bernardino engineers had diverted the course of Lytle Creek, to better serve municipal needs. When this great 1938 flood hit that section, Lytle Creek ignored the man-made channel it had used for years and tore its way thru the city and surrounding valley along the course of its old bed, in a raging torrent a mile wide. Many lives were lost here and the property damage in San Bernardino county was relatively in proportion to that of the Los Angeles section.

In the peak of the storm, during one 24-hour period, four inches of precipitation fell along the sea coast, five inches in the valley and coastal plain area, seven inches in the foothills and ten to twelve inches in the higher mountain regions. One mountain station registered 15.96 inches of rainfall within the 24 hours storm peak; another 30.8 inches during the entire 120-hours highest storm period.





Thousands were rendered homeless; whole villages were swept away, their buildings rolling down the canyons amidst vast masses of boulders and debris, smashed to kindling wood; autos caught on main highways in the path of the flood-made rivers were so completely covered with sand and silt that their location afterwards was often a matter of guess; undermined highways and railroad grades simply melted away before the onslaught of the waters, their courses marked by upended blocks of concrete, networks of tangled wires and power poles sticking grotesquely out of the mass of rubble.

When the storm subsided and southern Californians could take stock of their losses, the total property damage was set at 83 million dollars, besides the loss of 81 lives, and this in face of the fact that Los Angeles city alone had previously spent 60 million dollars in flood protection work, and, incidentally, at the same time of the great storm was just preparing to expend 70 millions more for the same purpose.

Even before the flood catastrophe of 1938, the worst which had occurred since American pioneer days, more and more attention was being paid to the source of the State's water supply, the great mountain area of the State. The Flood Control Act of 1936, supplemented by the Flood Control Act of 1938, divided the work of controlling runoff water between the War Department and the Department of Agriculture. Recognition of the fact that control of the water higher up - water which was so badly needed during the dry season - rather than the building of works to push it on to the ocean during flood periods is the most efficient practice, is indicated by this legislation which in a sense threw some of the responsibility on the men guarding the source of the water - the forest rangers.

Snow surveys were started on a large scale in the winter of 1937-38, to be interpreted in the form of more exact precipitation data by the Federal Weather Bureau. This snow survey of the State's mountain area cost \$100,000, besides the free service of forest rangers, Park Service rangers and employees of railroad, mining, power and lumber companies. The expenditure was amply justified by the fact that it resulted in securing 30,000 exact snow depth measurements over the entire snow belt of the State.

Previous data had already been recorded at scattered points. The vagaries and contrasts of California's versatile climate were further revealed by this snow study. Summit, elevation 7,017 feet, on the mail line of the Southern Pacific, where railroad tracks were kept clear of snow only by the sturdy sheds built over them,



recorded an average snow depth of 419 inches over a period of 44 years. So far as is known, the snow depth recorded at Tamarack, not far distant from Summit, 884 inches, has never been equalled anywhere in the continental United States.

The value of the mountain watershed cover whether to hold back snow or to break up and absorb the descending lashing rain, was perhaps never better illustrated than in the case of a heavy rain and localized flood conditions just northwest of the city of Santa Barbara during the last days of 1940. The illustration is perhaps the more remarkable in that it was not the result of any extensive, expert survey but merely visual evidence picked up on the ground by forest rangers and local residents, some among the latter of whom had previously doubted the efficacy of heavy brush watershed cover.

A fire, started by a careless smoker in the midsummer of 1940, raged over some 4,000 acres of Los Padres National Forest, and intermingled private lands. The burned area, swept almost clean of all vegetative cover, was located just above the lemon groves and intensively-used farm lands of Goleta Valley. Mustard planted by the Forest Service on the rugged, fire-swept slopes, had not yet established any material protective cover when heavy winter rains hit the area. Long stretches of the main San Marcos State Highway simply sluffed off into the canyons as tons and tons of soil and boulders were swept down the steep slopes by the lashing storm, which delivered around seven inches of precipitation in three or four days. Considerable damage was done to the farms below, and a big airfield badly silted.

After the skies had cleared and the boulders stopped rolling, samples were taken of the waters of San Jose Creek, one of the streams in the burned over watershed - not in the hills but down at the edge of the valley area. Although the flow was greatly retarded by that time, these samples showed slightly over eighteen percent silt. Since the creek had a flow of 344 cubic feet per second, or 1,238,400 cubic feet per hour, this meant 229,912 cubic feet of silt per hour, signifying the loss of one foot of topsoil from 5.11 acres every hour.

The flow of San Jose Creek continued unabated for several days, and undoubtedly at the peak of the storm carried some fifty percent solid matter in addition to the rocks and boulders which could be seen strewn along its course. Now, just over the divide from San Jose Creek, Bear Creek, a similar-sized stream, flowed thru an unburned watershed subjected to the same storm. Samples of the water taken from Bear Creek at the same time as those taken from the San Jose flow were clear, without any sediment whatever.





In spite of the rosy picture painted by land boosting organizations and the optimistic chambers of commerce which are so much a part and parcel of California's economic existence, life was not all beer and skittles for California farmers. Just as its competitor state, Florida, suffered from tropical hurricanes which spread death and devastation, other vagaries of California's much advertised climate plagued the land user, in addition to the floods resulting from untimely and too generous rains. About once in every ten years or so the sub-tropical parts of California suffer from killing frosts which no amount of artificially-applied land-warming heat can overcome.

The frost-free, almost perfect climate of San Diego registered no temperature below freezing for 40 years, then in January 1913, the thermometer dropped to 25 degrees Fahrenheit and a forty-million dollar damage resulted to that county's crops. The frosty spell which hit California in the winter of 1922 spelled a twelve million dollar loss for the orange growers. Probably the worst freeze ever experienced in that section, characterized by local boosters as "The Land of the Beckoning Climate," was that of 1937, which blighted the entire citrus belt. About half of the orange crop was taken, the loss being estimated at 50 million dollars.

In this 1937 freeze thousands of citrus growers supplemented the familiar smudge pots in their orchards with bonfires fed with firewood, old tires or anything combustible. In desperate efforts to neutralize the frosty air in their groves, some farmers even chopped down numbers of the orange trees themselves to use as fuel to save the remainder. Many small farmers, their high priced lands mortgaged to the hilt, lost their holdings in this 1937 freeze.

During the peak of the cold weather the entire countryside was covered with a black pall from the smoke of smudge pots, and particles of black smudge settled over the goods on merchants' shelves in the citrus belt towns. White Leghorn chickens turned into Black Minorcas, heavy smudges adorned the linen of white collar workers, and black and white dogs disporting in the soot-laden grass turned into one solid ebony color.

These occasional frosts during the twenties and thirties emphasized an already known feature of land use in the ever-expanding citrus belt. It was more than ever noted that while the bottom land orchards were ruined by the frosts, groves located on hill-sides at an elevation of 50, or even 25 feet higher, suffered less injury. Hill lands, altho cheaper, cost more to handle because of the factors of irrigation water lift, and the necessity of terraced cultivation to prevent soil erosion from the lashing winter rains. There was a decided tendency to climb the lower slopes with citrus groves during the 1920-40 period.





## The Great Central Valley Project

By 1933 over two-score of lengthy, detailed reports on State-wide water conservation were on file at the State capital and some two million dollars had been expended on investigations alone in the matter of State-wide water plans. The south had pretty well solved its problem with the out-of-state Colorado River water. In 1933 the voters of California ratified the action of their governor and legislature in approval of a State-wide plan of a magnitude and complexity equal to that of the great Boulder Dam system. This was called the Central Valley Project, a complex water storage and distribution system reaching from the headwaters of the Sacramento to the Tehachapi Range.

The cost of this huge project was originally estimated at 170 million dollars but estimates later jumped to 228 million. It had the endorsement of all water experts including the War Department and the Bureau of Reclamation, the latter charged with the problem of its construction. Handled by the Water Project Authority of the State of California, a State-created corporation patterned after the Tennessee Valley Authority, the project has five main purposes; first, irrigation water; second, salinity control; third, navigation; fourth; conservation and flood prevention; and fifth, hydro-electric power.

Tersely put, two-thirds of the water delivered on the State's watersheds tributary to the Interior Valley Region, runs off in the Sacramento River, and one-third in the San Joaquin. On the other hand, two-thirds of the irrigation requirements are in the San Joaquin Valley and one-third in the Sacramento Valley. Roughly, the Sacramento River drains 21,000 square miles while the San Joaquin, Kings and Kern Rivers to the south drain 18,000 square miles.

Briefly, the Central Valley Project is made up of two huge dams, one in the north and one in the south, a gigantic hydro-electric power plant, more than 200 miles of high power transmission lines, about 350 miles of main canals and many accessory structures such as pumping plants, bridges and tunnels.

Although authorized by the State Legislature, approved by the governor and ratified by the voters, no funds were available for the project until 1935 when Congress, on the recommendations of the War Department, authorized 12 million dollars for the Shasta Dam to improve navigation and flood control on the Sacramento River. While the Bureau of Reclamation started preliminary work that year, it was not till July, 1938, by which time additional funds were forthcoming, that contracts were let for large construction operations. At this time twelve large construction companies were



awarded contracts aggregating \$35,939,450. Actual construction work on the Shasta Dam was started in September 1938 and has been continued on a large or small scale basis almost night and day ever since. Contract was let for the Friant Dam in October 1939 to the amount of \$8,715,538. The Bureau of Reclamation experts originally expected to have the main features of the Central Valley Project completed in October 1944.

The Shasta Dam is located 12 miles north of Redding and being next in size to Boulder Dam is the second largest in the world. Five hundred and sixty feet high and 3500 feet long, the artificial lake which it creates covers 29,500 acres, almost equal to the area of Lake Tahoe. It impounds 4,500,000 acre-feet of water, being fed by three rivers, the Sacramento, Pit and McCloud. One-ninth of the impounded waters, or 500,000 acre-feet, will be perpetually held in reserve to prevent floods in the great valley below the dam.

The power plant at Shasta Dam can be made to produce one and one-half billion kilowatt-hours of electric energy. After providing for the power needs of the entire Central Valley Project itself, there will be left available for distribution and public consumption well over one billion kilowatt-hours. Some idea of the volume of electric energy generated here can be gained from the fact that the annual production would operate every household appliance in the United States for 40 days, or furnish all the electrical needs of the city of San Francisco for 22 months.

Four hundred miles south of the Shasta Dam and 20 miles northeast of Fresno, on the headwaters of the Merced River, is located Friant Dam, which creates the second large impounding lake of the project. The Friant Dam is 275 feet high, almost as great in length as the Shasta Dam and impounds 520,000 acre-feet of water held within an area of 4,900 acres. The Friant Dam will perpetually hold back 70,000 acre-feet of water as a deterrent to floods in the valley below. These two artificial lakes provide approximately two-thirds as much water storage as all the other water storage facilities heretofore constructed within California.

Of the canal system on the project the Friant-Kern, delivering water for thirsty San Joaquin Valley lands south to the Kern River, 160 miles distant - by gravity flow - is the largest. Following the foothills of the valley for a large part of its distance, this canal is 70 feet wide at the top and 30 feet wide at the bottom. The Madera Canal, 40 miles long, also conducts water by gravity flow from the Friant Dam to the Chowchilla River.





The San Joaquin Canal and Pumping System, carrying the water down the westerly side of the valley is 100 miles in length and requires seven pumping stations to lift the surplus waters of the Sacramento River a maximum of 200 feet to push them on to where they are needed to the southward.

In the upper San Francisco Bay Region the Contra Costa Canal, 46-miles in length, lies but slightly above sea level. To boost the waters from the delta lands level to the elevation necessary for it to flow by gravity to the urban centers and farm lands where it is to be used, four big pumping stations are necessary. One of the great engineering feats of the Central Valley Project, indeed, is that of taking the surplus water of the Sacramento and lifting it over into the immense, fertile San Joaquin Valley where the irrigation experts estimate 2,500,000 acres of new lands will be brought under irrigation by this new water. On completion of the distribution of water made available by this immense project, the State engineer estimates that a total of 8,356,000 acres will eventually be brought under irrigation in the two big central valleys of California.

It is confidently believed by most water experts that the volume of fresh water pushed out into the rich delta region will permanently solve the salinity problem. The industrial area in Contra Costa county alone has an investment of some fifty million dollars in canneries, sugar refineries and similar plants engaged in processing products of the land. These need and use vast quantities of fresh water, the consumption of one plant alone being more than one million gallons daily.

Engineers engaged in the construction of the great Central Valley Project estimate that \$2,250,000 annually will be saved by the use of water transportation between Sacramento Valley points and tide-water, and the most optimistic of them visualize river steamers again plying up the Sacramento as far north as Red Bluff, 245 miles from San Francisco, as they did in the great gold mining era before the misuse of the lands above had silted the river channel.

The Sacramento River flows a total distance of 320 miles; the San Joaquin is approximately 325 miles long; and lest the volume of water freightage be considered insignificant, it may be pointed out that even with their greatly shrunken navigable distance, the Sacramento in 1934 carried 1,183,650 tons of freight, valued at 35 million dollars, and the San Joaquin 1,046,066 tons, worth 38 million.

Plans for the great project were worked out in meticulous detail by experts, checked and rechecked. The problems in its operation are many, not the least of which is that of more adequate



protection of the immense watershed which, after all, furnishes the water. The planting of millions of new trees to reforest areas ruthlessly destroyed by misuse in the past and the changing of the habits of millions of annually spawning salmon meeting the new barriers in their path to the mountain streams of the north, a water path to spawning areas used by their predecessors for centuries, are in themselves two major projects.

The immense production of hydro-electric power at the Shasta Dam is another problem of the first magnitude. While it insures plentiful and cheap power for thousands of rural residents, it brings up the subject of public ownership competition with private concerns already serving the territory. Undoubtedly, the final solution of this problem will be distribution of this cheap power thru the medium of the public utility companies.

The profile of California from the Oregon line to Tehachapi, already much altered by almost a century of American use, will be still more greatly changed by the Central Valley Project so much so, in fact, that State educators deemed it necessary to get out a special textbook for the school children of the State. The summarizing paragraphs in this book read in part as follows:

"All the money and materials and labor going into the building of the Central Valley Project have been spent to preserve and control and provide for man's use one valuable resource - water. Back of all the planning, the making of laws, the raising of money, are the needs which the project will fulfill; the need to overcome both flood and drought; the need for water - water in the river beds to float vessels; fresh water to hold back the salty ocean tides from creeping inland; water in reservoirs and canals to feed factories and farms; water plunging into power turbines to generate electric power . . . . it will serve these purposes, all achieved by harnessing water; irrigation, salinity control, navigation, conservation and flood prevention, and hydro-electric development. The project when completed, will be the most complicated irrigation system in history.

The rain which falls in the wet, wooded Siskiyou and Cascade Mountains of the far north will be moved all the way to the parched plains of the San Joaquin Valley in the south. And here water will again transform thirsty, dried-up fields into green acres and blooming orchards. Man will correct his mistakes of the past and conquer the creeping menace of drought now threatening the rich farm lands of central California."



In the chapter devoted to California in their quite outstanding book on North America as the Home of Man, Professors J. Russell Smith and M. Ogden Phillips, referring to the great Central Valley Project, query, "The usefulness of these reservoirs is greatly dependent upon the forest cover from which the drainage comes."

### Farm Conveniences

In spite of the immense volume of electrical power developed and in the process of development on publicly-owned water projects, public utility companies continued to expand. California's output capacity of electrical energy in 1941 was given at  $13\frac{1}{2}$  billion kilowatt hours, exceeded among the states only by New York and Pennsylvania. There were 2,600,000 registered meters in California that year. However, in the matter of generating electrical energy by means of water power no other state approached California, her output representing more than one-fifth of the entire nation's hydro-electric generation.

Fifty-four percent of California farms were electrified in 1935, so it is not surprising that the Rural Electrification Administration, created by Executive Order in 1935, found comparatively few projects in California. This Act of the administration, and which had for its purpose the transmission of electricity - in the phraseology of the Order, "to as many farms as possible in the shortest possible time, and have it used in quantities sufficient to affect rural life" - was a great boon to American farmers generally. By 1939, however, only three concerns in California were taking advantage of this Federal aid to extend their lines to outlying farms, a much lesser volume than in other agricultural states.

The year 1941 witnessed some two million telephones in use in California and few farms in the State but boasted a late model radio. That very same year all of Italy was credited with having only 685,000 telephones; Great Britain with 2,300,000; the Japanese Empire with 1,068,000, and Germany with three million. That year statisticians gave the railroad mileage in California as 10,300 as against 11,400 in Italy; 37,000 in all of Germany, and 15,000 miles in all the Island Empire of Japan. Incidentally, the number of motor vehicles in California was 10,300 as against 11,400 in Italy; 37,000 miles in all of Germany, and 15,000 miles in all the Island Empire of Japan. Incidentally, the number of motor vehicles in California in 1941 was given as 3,200,000 in comparison with 1,125,000 in Germany, and 133,000 in Japan.





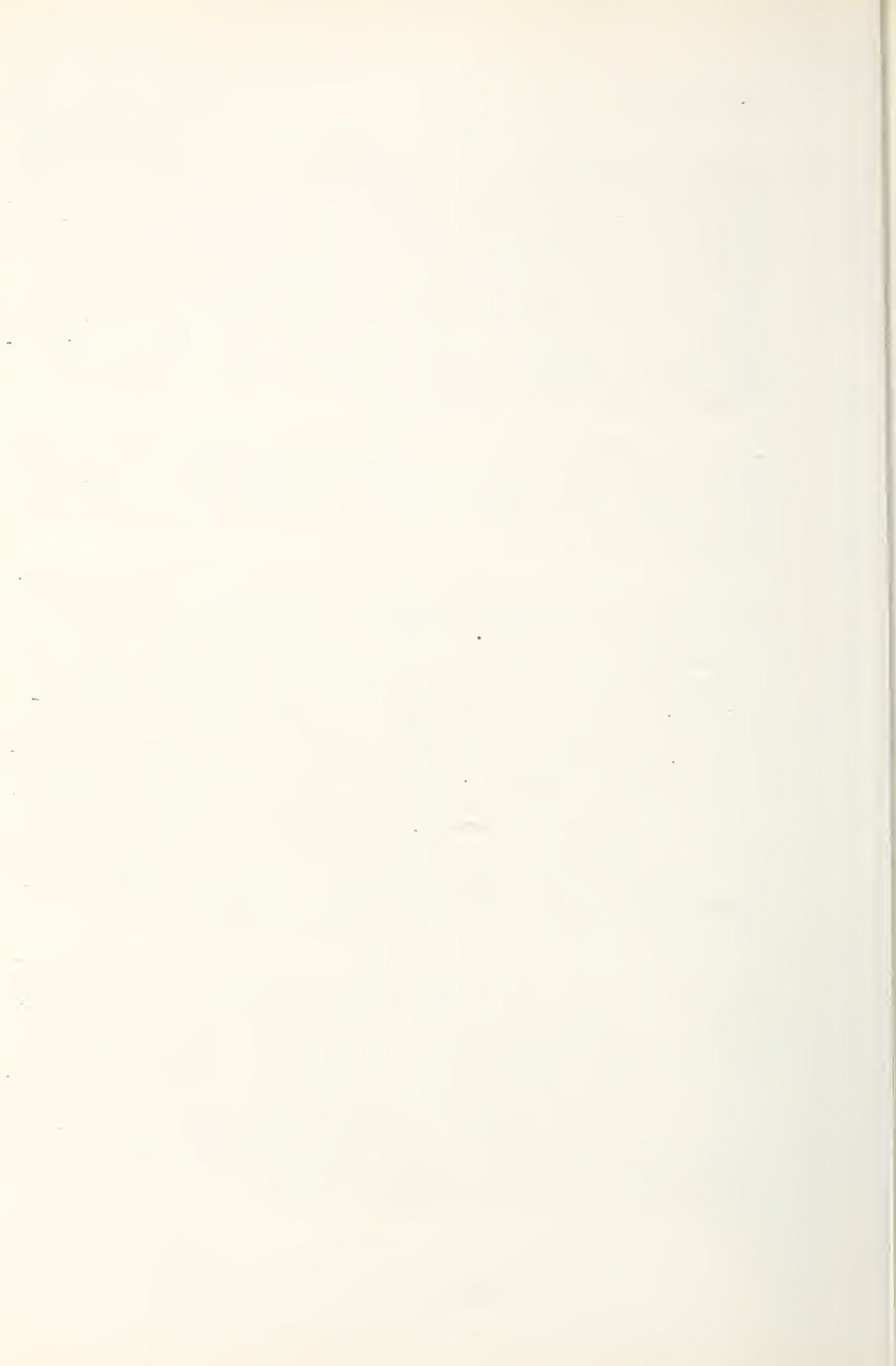
## WPA and CCC

The period from 1933 to 1941 probably witnessed a greater volume of land use legislation than any other period in American history. This was quite logical with an ardent conservationist in the White House, faced with the joint problem of unemployment relief and rehabilitation of rural lands thruout the nation. Outgrowth of the various Federal efforts to relieve unemployment, the Works Progress Administration, providing employment on public works of laborer, artisan and professional man alike, was responsible for many miles of new roads and highways and betterment of thousands of acres of public parks - urban and natural. It built water systems, sanitation systems, public buildings and other municipal, State and Federal projects almost innumerable.

Since in California work of the WPA covered practically the entire range of human endeavor, including Federally-employed writers of high ability who have left voluminous records of its accomplishments, brief mention only is being made of this gigantic Federal department here.

As time went on and gradual recovery from the industrial depression took place, WPA became somewhat of a thorn in the flesh of the independent taxpayer. Undoubtedly many California laborers regained their self respect and a new foothold on life thru this agency - others lost what self respect they had thru employment for months and years on what came to be popularly termed "leaf-raking" projects. Certainly, WPA was better than the charity dole meted out to millions of American workers and a prevalent form of relief in other countries. Regardless of political fights put up in some quarters for the retention of the Works Progress Administration as a government bureau, Californians generally were well pleased to witness its abandonment after it had served its purpose as a makeshift labor-employing agency. By the time World War demands for labor more than justified its discontinuance, it was manned pretty much by professional unemployables.

The immense area of national forest land in California ever presents a reservoir of jobs needing to be done. Rural communities, hard put to provide jobs for their unemployed, were glad to turn over a considerable number of their WPA quota to the Forest Service, by whom thousands were at different times employed in fire protection, reforestation, construction and maintenance of roads and trails, and on similar activities. It is perhaps somewhat of a tribute to the rural laborer, after all, that while the mountain foresters demanded a fair day's work from these WPA laborers and some of the work was gruellingly hard, there was usually a waiting list of men desiring employment on forestry jobs rather than on urban and semi-urban projects.



The record of the Civilian Conservation Corps stands as an undying monument to Franklin Delano Roosevelt while German youth were learning the art of killing and adopting Hitler as their new Deity; while the youthful, black-shirted Italian legions were marching towards promised world conquest under Mussolini, and while Japan was imbuing her boys with the idea of a world dominated by Japs, the conservationist at the head of American national affairs evolved the idea of an entirely different combined educational, training and work corps composed of American youth. This joint educational and work accomplishment program, applied to the land itself, was something quite new in world history.

Started in the spring of 1933, the Army managed the Civilian Conservation Corps camps, and public agencies directed the work of the enrollees on various conservation and land-using projects. As the leading government departments connected with land use, the Department of Agriculture and the Department of the Interior were responsible for the planning and execution of 98 percent of the work projects nationally undertaken during the ten years of the Corp's existence. The Forest Service was responsible for 80 percent of all the work projects of the Department of Agriculture. By mid-1933, CCC camps dotted the California rural landscape.

The following tabulation shows the number of camps operating in California between 1933 and 1941, the different agencies directing the work and the number of enrollees at stated intervals:

CALIFORNIA CCC CAMPS 1933 to 1941

Number of Camps in Operation by Different Agencies

Date	: U. S. :	U. S. :	U. S. :	State :	:	:	:	Total Num-
	: Forest :	Park :	Soil :	Park :	Other :	Total :	ber of	
	: Service :	Service :	Conserv :	Service :	Agencies :	Number :	Enrollees	
		: Service :				: of Camps :	in Camps	
							on Date	
9/30/33	: 150 :	12 :	- :	5 :	4 :	471 :	13,941	
6/30/34	: 39 :	13 :	- :	14 :	10 :	76 :	12,851	
6/30/35	: 73 :	15 :	12 :	31 :	24 :	155 :	21,859	
6/30/36	: 56 :	12 :	10 :	21 :	19 :	118 :	9,481	
6/30/37	: 50 :	11 :	9 :	15 :	16 :	101 :	6,086	
6/30/38	: 41 :	10 :	8 :	11 :	15 :	85 :	6,416	
6/30/39	: 36 :	13 :	8 :	12 :	14 :	83 :	8,026	
6/30/40	: 36 :	13 :	8 :	8 :	15 :	80 :	7,370	
6/30/41	: 36 :	14 :	8 :	7 :	17 :	82 :	4,551	

Number of camps represent the average distribution for the preceding Fiscal Year.





Besides the above, a few camps were operating on private forest land improvement, and although the CCC was purely a rural organization, an occasional camp was located in or close to metropolitan areas where large scale landscaping or similar work was under way. Besides the agencies shown above, CCC camps were operated in California by the Interior Department Grazing Service, Bureau of Reclamation and Biological Survey. The War Department itself operated camps on military projects for brief periods.

Indian companies, as well as companies composed exclusively of negro enrolled personnel, were formed and a few veterans, older men who were ex-members of the armed forces, were added to the junior companies. In January 1937, out of a total of 350,350 enrollees in camps thruout the nation, 36,240 were 17 years of age, 183,629 were 20 years or younger, and over 290,000 of the enrollees were under 25.

Enrollees worked on field projects eight hours per day and five days per week. Their remuneration ranged from \$30 to \$45 per month, plus board, lodging, clothing, medical attention and all the work training and theoretical education they were able to absorb. Around 75 percent of the earnings of the CCC boys reached the families of the enrollees. Recreation and athletics were a definite part of the CCC curriculum. Although professional teachers, or educational advisers, were furnished to camps, in 1938 only 1537 were employed, out of a total teaching force of 28,168. Project superintendents and foremen, Army officers, WPA and NYA officials formed the bulk of the teaching force.

Skilled trades were taught the enrollees and on-the-job training became a definite responsibility of all facilitating personnel, the boys learning by doing. The usual complement of overhead personnel for a CCC camp of around 200 enrollees consisted of two Army officers, a project superintendent and three to five project foremen or work specialists. The Army was responsible for the enrolled personnel when they were not working on field projects, the work agency concerned while they were on the job. The minimum period of enrollment was six months, but many enrollees stayed with the organization for years.

There was a constant graduation from the CCC ranks into private industry and an honorable discharge from the CCC was a good recommendation in any young man's favor.

Although considered on the start as one of the various work relief agencies of the New Deal administration, the relief angle of the Civilian Conservation Corps was later pushed into the background and it became an out and out work agency engaged mainly in betterment of wild lands, as well as a training organization for young men.



In his report of 1938, at which time the President's popular Civilian Conservation Corps bid fair to become a permanent institution, the late Robert Fechner, at that time Director of the Corps, listed the classes of work to which the organization would contribute its efforts as follows: (1) Reforestation; (2) Forest protection and improvement; (3) Park protection and improvement; (4) Soil conservation; (5) Wildlife restoration; (6) Upstream engineering and (7), "Only to a limited extent ....to such projects as grazing control on the public domain and to drainage rehabilitation work in developed agricultural areas."

On the final abandonment of the CCC on June 30, 1942, due to the exigencies of war, the United States Department of Agriculture published this statement:

"The Civilian Conservation Corps was the greatest blessing ever to come to the forests, soils and waters of the country. It will go down in American history as a great and worthwhile achievement in conservation of natural resources, in human conservation and also as an experiment in practical training and education of youth."

The comment of the California Region of the Forest Service on the organization, made at the same time, was worded as follows:

"It immediately develops that a large number of the projects which were undertaken for peacetime use, administration, improvement or protection of the forests of California are potentially and actually of tremendous importance under the conditions of war. Previously inaccessible forest products, such as timber and strategic minerals, are now within reach, when needed, as a result of 7,970 miles of CCC-built roads that also provide easier access for the control of fires, an important military objective. Many streams that would otherwise be serious barriers have been spanned by sturdy, CCC-built bridges, thereby providing the means for rapid movement of men and heavy equipment.

In the organization, thousands of enrollees have learned how to work and have gone from the CCC to obtain and hold good jobs. Some have made a long step toward acquiring skills and have advanced their education. They are filling many types of positions in the nation today. A great number are applying their CCC-gained knowledge and using their CCC-gained healthy muscles in the nation's armed forces or in defense industries. The physical development



of these young men, under regulated work and living habits, has been amazing. The building of physically fit bodies has been an even greater accomplishment than the building of dams and firebreaks.

Outside the CCC, the entire commonwealth of California has benefited and will continue to benefit for many years from the enterprises that the CCC has completed for the protection and improvement of the public's natural resources."

Probably no State's wild land resources and, incidentally, the contiguous cultivated lands, benefited more than the CCC activities than those of California.

Although the CCC was in no sense a military organization, the enrollee's training brought about habits of discipline, patriotism, organization loyalty, personal cleanliness and a high code of honor and fair play, training from which the boys themselves and the nation was to greatly benefit when actual war came. Nor can the value of the training received by thousands of regular Army and Reserve Officers, serving as CCC overhead, be overlooked as a later aid to the national war effort. It might be a safe bet to predict that the Civilian Conservation Corps in some form will again become a live organization.

Space in these pages will not permit a detailed list of CCC work accomplishments in California, mostly in her mountain forests. Besides maintenance of all classes of improvements, the CCC built 242 horse bridges; 560 vehicle bridges; 7,850 miles of minor roads; 1,120 miles of foot and horse trails; 13,600 miles of telephone lines, 656 dwellings; 250 lookout houses or towers, and 1,950 other major and minor buildings, other than small structures such as latrines.

The CCC boys constructed 155,000 rods of fencing; 24 large water impounding dams; around 75,000 cubic yards of levees, dykes and filled cribbing; 2,865 water supply systems; 1,845 sewage disposal systems; 7 airplane landing fields, and almost 9,000 other individual miscellaneous structural improvements. As a part of their work only in soil erosion control, they handled 164,445 square yards of bank sloping; built 946 permanent check dams; seeded and sodded almost one million square yards, and planted 75,000 square yards of shrubs and trees in gullies. They cleared over two and one-third million square yards of channels and levees and built over forty miles of waterways.

The CCC youths planted 21,254 acres of tree seedlings; carried on timber stand improvement on 6,400 acres, and furnished the labor for tree and plant insect and disease control operations





on almost a quarter million acres of forest lands. They reseeded 7,100 acres of depleted range and built 59 miles of livestock driveways. The enrollees in California camps also spent 778,600 man-days fighting fire, and 884,000 additional man-days on fire prevention and fire presuppression work. They cleared weeds and inflammable materials from 7,475 miles of roadside as an annual fire hazard reduction measure, and inflammable debris from 83,000 acres more.

The men of the CCC constructed many hundreds of public camps, covering some 4,100 acres of mountain lands, and razed about 38,000 unsightly structures marring the mountain landscape. They built 11 fish-rearing ponds and planted almost four million fish fry in the streams of the state. They covered 1,300,000 acres in the control of range-destroying rodents and other pests. In addition to their firefighting activities these boys spent 20,000 man-days on emergency work involving the saving of human life and property. They cruised timber, made maps, conducted land surveys, built firebreaks and collected tree seed; in a word, this peacetime land army participated in all the activities of the forest rangers who directed their efforts. Many of these ex-CCC enrollees, when they finished doing their part in fighting for the establishment of the Four Freedoms returned to the mountains and the forest work they had learned to love.

There is no doubt that the course of the CCC was a great impetus to the cause of conservation in California. It strengthened the voice of the forest ranger who had been veritabily alone in preaching the concepts of conservation to a more or less complacent citizenry for more than a quarter of a century. The public was beginning to realize more and more how forest devastation, soil depletion and exploitation of our natural resources had laid a heavy hand on California.

The splendid work of public-spirited citizen conservation organizations, obligated to no special government or private agency, cannot be overlooked. Several of these crystallized to a great extent into the California Conservation Council as a medium of urging better conservation practices. Miss Pearl Chase of Santa Barbara, who with her associates kept conservation ideals alive among all classes of Californians, has for years been the moving spirit of this organization. Miss Chase attracted nationwide attention by giving her own time exclusively to California conservation efforts.

### Traveling California

Recreation demands on the mountain lands continued to grow. In 1935, recreation visitors to national forests in California for



the purpose of hunting, fishing, winter sports, or merely to camp for a few days, numbered 3,729,000. In 1941 this number had grown to 4,539,000 people who made an average stay of 4.3 days. Besides these, in 1941 there were over five and half million people who made trips of one day or less to the national forests of the State for outdoor relaxation.

In 1935 the U. S. Park Service checked 747,133 people into the four national parks of California; in 1941, 1,555,000 people visited these outstanding scenic mountain areas. The number of visitors to the Lassen Volcanic National Park alone - an area somewhat off the beaten track of tourist travel - jumped from 52,294 in 1935 to 104,619 in 1941. Figures for visitors to the national parks do not include those people visiting national monuments.

By 1937, the U. S. Park Service was administering 3,830,610 acres of wild lands in California included within the boundaries of the four national parks and seven national monuments. However, of the 2,584,243 acres included in the seven national monuments, 1,601,800 acres constituted the desert area of the Joshua Tree National Monument and 825,340 acres covered the rocky fastnesses of Death Valley, hence acreage figures mean little. After years of controversy between the exponents of wild land conservation and those subscribing to the theory of preservation, the scenic Kings Canyon mountain area of 455,000 acres was taken from the Sequoia National Forest and added to the General Grant Park in 1940.

California's new State park system by the early 1940's involved 70 units. Sixteen of these were structures or locations prominent in California history, called Historic Monuments. The State was able to acquire a considerable ocean beach frontage and at the outbreak of the war was administering some score of this type of public playgrounds, improved or in process of development.

It had outstanding redwood groves, unique mountain and desert areas, and some scenic waterfalls included within the 300,000 acres of public parks under State administration. California estimated the value of its State park system at fifteen million dollars.

The outdoor recreation business had reached tremendous proportions and the magical name of California continued to draw more thousands each year. Some sections of California lived exclusively off the dollars of the tourists. The two big cooperative automobile associations, the California State Automobile Association





and the Automobile Club of Southern California, served both the local membership and the out of State tourists in their respective territories. These two official state automobile associations reported 433,361 foreign cars, exclusive of trucks or stages and carrying approximately 1,386,000 passengers, as entering the State in 1938. The same figures for the year 1941 showed 636,390 of these non-commercial vehicles and a total of around two million passengers.

Since California maintained strict border patrol for plant quarantine purposes, these travel figures, originating with the agency carrying on that work, can be considered accurate. Even in the first war year, or in 1942, 399,018 foreign cars entered the State, transporting over a million and a quarter people. The number of people entering California as passengers on motor stages is given as 262,346 in 1938; 294,043 in 1939; 369,458 in 1941; and 644,570 in 1942. In the last two years cited, members of the armed forces, workers in war plants and their respective families, of course, constituted a large percentage of the travelers.

California was pretty well organized to take care of its immense and very profitable tourist trade. Besides Federal, State and municipal agencies and official automobile clubs, various organizations of the Chamber of Commerce type sponsored by different areas, catered to the tourist travel. Two of the many such thruout the State, for instance, were the Mission Trails Association and the All-Year Club of southern California. Naturally, in the thinking of these organizations, every tourist was a prospective California settler or land buyer, or both.

Records kept by the All-Year Club indicate that 784,541 people classed as tourists entered southern California in 1933 and spent \$91,588,000 in that area. Similar figures for 1935 show 1,270,078 tourists spending \$155,763,000 in the southern part of the State. The 1938 figure of this tourist agency lists 1,638,834 people spending over \$194,684,000. In 1941, the same authority placed the southern California tourist volume at 1,869,614 people spending the huge sum of \$202,189,000 that year in much-boomed southern California.

#### Hunters, Anglers, Fish and Game

Don Thomas, the managing director of the All-Year Club, admits that there is no segregation of numbers of people who stick to the main traveled routes versus those who spread out in rural communities and back country areas. It is, therefore, impossible to state the financial benefits accruing to the rural sections of the State, but that they were considerable is evidenced by the large numbers of hunters and fisherman faring forth over California's



broad domain. In 1935, 174,667 hunting and 224,661 angling licenses were issued to California sportsmen. In 1940 this number had increased to 270,095 hunting and 388,472 angling licenses.

In 1935 a total of 21,955 deer were bagged by hunters in California; in 1939 this figure showed 43,250, and in 1941 in the hinterlands of California 43,493 bucks fell before the hunters' guns. Besides this bigger game, officers of the State Division of Fish and Game gave 950,000 ducks as the 1938 bag of California hunters, 83,000 geese, 1,700,000 doves, 98,000 pigeons, 1,550,000 quail, 125,000 pheasants, 750,000 jackrabbits and 450,000 other species of rabbits were listed as the take in the same report.

This bag of small game, representing a fair annual average, is quite remarkable in view of the fact that great numbers of California's game birds were artificially propagated - mainly pheasants, which were introduced to California from other sections.

The two large State-owned game farms, at Yountville in the north and Chino in the south, alone released in 1936 a total of 21,587 pheasants and 19,843 quail. At Forest Service ranger stations in the mountains game bird propagation was carried on in cooperation with the State officers and all up and down the State hundreds of volunteer game bird enthusiasts were engaged in hatching and rearing wild birds, turned loose in the fields and forests under the sponsorship of game wardens and sportsmen's associations.

Working in close cooperation with the Federal Biological Survey - later the Bureau of Fish and Wildlife Service - the U. S. Bureau of Fisheries, the U. S. Forest Service and kindred governmental agencies, the California State Division of Fish and Game was doing a wonderful work in the conservation of California fish and wild life. The old type of hard-boiled game warden had disappeared from the California hills. Still a fearless woods policeman, whose main duty was to enforce the protective laws, the modern game warden was also a combination scientist, educator, and friend of the land and people.

One of the finest moves in wild life conservation was the establishment in 1914 of the State quarterly "Fish and Game," which adopted as a slogan "Conservation of Wild Life Through Education." This official publication soon won national prominence with its authoritative scientific data, its California fish and game statistics and its interesting sidelights on wild life. The first editor of this house organ was Harold C. Bryant. Richard S. Crocker, who succeeded him, has guided its destinies for several decades.

That as part of outdoor recreational use of wild lands, hunting and fishing together was the indisputable leading activity is indicated





by the figures in the fiscal year 1941 report of the State Division of Fish and Game. Receipts that year from the sale of commercial and sportsmen's licenses, lease of kelp beds, special permits and the like, brought the State a revenue of \$2,061,000. Expenditures of the Division for the year were \$1,662,000.

The State Chamber of Commerce and the State's wild life agency worked up detailed figures in 1938 which pretty well proved that the average holder of an angling license spent \$87 a year in connection with his sport. Since 346,661 California angling licenses were sold that year this would involve the rather substantial sum of \$30,160,000 placed in circulation in the State. Average per capita figures of hunters' expenditures ran still higher.

In 1941, either as State enterprises or in cooperation with the Federal fish propagating agency, the State was operating 54 hatcheries and spawn-taking stations, furnishing the millions of young trout and salmon to restock the State's waters. Operation of the big Mt. Shasta hatchery alone cost \$73,187 that year. Working with the Federal Fish and Wildlife Service, the State spent almost \$70,000 on predatory animal control.

The number of predatory animals trapped by government hunters was 2,038 in 1937; 3,736 in 1938, and 5,491 in 1939. The main predator was still the slinking coyote, the sworn foe of the sheepman, the farmer and the hunter. Killing thousands of deer each year, and a menace to the livestock industry, in spite of the relentless war waged against him, the coyote was still pretty well holding his own against all the encroachments of man on his domain. In 1941 forest rangers estimated that there were 57,450 coyotes on California's national forests, besides those which preferred the more effete atmosphere of the foothills and farm lands.

The inventory given that year by the Forest Service - considered the most accurate obtainable - of wild animals inhabiting the national forests of the State and contiguous areas, included 3,500 antelops, 13,000 black or brown bear, 244,000 mule deer, 165,000 black-tailed deer, 460 elk, 500 mountain sheep, 32,930 bobcats, 1,165 mountain lions, 36,400 fox, 11,640 marten, 8,900 mink, and 355 beaver.

The forest rangers' animal inventory included 28,775 muskrat and 4,080 opossum inside the national forest alone - both animals introduced species. The muskrat was brought into California around 1920 and although now found in nearly all sections of the State except in the Central Valley and Coast Regions, made its greatest gain in numbers in the northeastern part of the Mountain Region and in the Imperial Valley.





In the winter of 1931-32, thirteen hundred trappers reported to the State authority the taking of 150 muskrats as part of their catch; in the winter of 1939-40, eleven hundred and seventy-nine trappers reported a catch aggregating 69,596 of these leading furbearers.

The opossum of Dixieland also took kindly to the California climate. Introduced in the early years of the 20th century, in the course of a couple of decades this animal was found in large numbers making its habitat in hundreds of canyons close to the congested areas of Southern California.

During the 1930's field officers of the State Division of Fish and Game, U.S. Forest Service, and U.S. Biological Survey turned their attention to transplanting beaver within the State. Successful new colonies were established here and there and this valuable furbearer and interesting animal so irrevocably tied into Western history is now well assured of being saved from extinction. In some locations, beaver colonies have already proven a blessing to farmers and irrigators by virtue of their upstream water control activities; in others, just the reverse on account of their tendency to tear down man-made irrigation works where such did not conform to the beavers' own idea of water storage.

Transplanting a black bear in the mountains of California was decidedly not a successful experiment. Wild life and nature enthusiasts thought a few black bear would add to the attraction of the heavily used mountain area above San Bernardino Valley. Twenty-seven of the animals were brought from the Yosemite National park and turned loose. Their tastes ran somewhat towards a civilized environment, so instead of seeking the farthest and loneliest hills, they developed a preference to roam around among the summer homes where they broke into cottages, upset garbage cans, frightened picnic parties and altogether made themselves a public nuisance.

A common denizen of the great pine forests lying in the northeasterly portion of the Mountain and Plateau Region is the bristly porcupine. In the later twenties this lowly animal, waddling about the woods on his own business, seemed to have acquired a decided appetite for the bark of young ponderosa pines. Many fine groves of young pines were either killed outright by girdling or so badly damaged that they would never make lumber trees.

The animals existed in apparently almost uncountable numbers, so control operations were initiated. It was found that in their migrations the animals used what was termed "rest trees," where they were wont to stop and rest for awhile from their wanderings. Officers of the Biological Survey devised small square wooden blocks in the middle of each of which an auger hole was bored.



This hole was filled with a mixture of salt and strychnine and the block fastened in one of the rest trees. Thousands and thousands of the animals were poisoned or shot, to the benefit of the forester and mountain farmer. The animals have an unsatiable appetite for salt and will ruin wooden tool handles impregnated with human sweat.

The porcupine is about the only slow-moving animal which a starving man can kill with a stick. For this reason he is legally protected in the cold, isolated northern forests. The feeling of pity on the part of hunters for his helplessness, coupled with the pioneer days idea of the porcupine being life-saving sustenance for a starving, snow-bound man, probably had much to do with his being let alone and his prolific increase in numbers in California's pine forests.

In 1940 the area included in Federal and State game refuges in California totaled 2,061,404 acres. A Game Management Area Law was enacted by the State Legislature in 1939. This law allows the owner of 120 acres or more of land to control hunting on same during open seasons. By dedicating the area to Game Management, he can use the land himself for hunting or charge others a shooting fee, - thus in a sense, creating a public shooting ground.

Besides the not inconsiderable number of trappers following this work as a vocation or as a part time job, there were a considerable number of fur farmers in California engaged in raising animals to produce the most costly furs such as black or silver fox. In 1930 there were over 225 such enterprises, but the outbreak of the war put a serious crimp in this business.

The more highly capitalized ventures survived and at the end of 1941, there was listed 125 fox farms on which were kept 20,000 animals, the land, equipment and stock representing an investment of three million dollars. The greatest center of the fox farming industry is at Big Bear Lake in the San Bernardino Mountains. There are over five thousand of these semi-wild animals on fur farms in this area.

The huge volume of fish mentioned as existent in California coastal waters by early-day Spanish explorers showed little sign of diminishment as time went on. Here and there inroads of Japanese fishermen whose main interest was immediate profit, somewhat depleted areas of shell fish, but this was in the main kept well in hand by law enforcement officers. Close offshore and river fishing steadily and greatly contributes to California's natural wealth. Richard S. Croker, editor of California's official Fish and Game, says, "Fishing in California is entirely by private enterprise without Government subsidy. All boats and equipment are owned by the individual or packing companies."





As a sample of the volume of California's fishing industry, fish landings from eight rivers and seaports in the State for October, November and December 1935 amounted to 499,346,176 pounds, embracing 60 different varieties of fish. While this almost half a billion pound catch included a comparatively small amount taken from Mexican waters, it did not include crustaceous or shell fish, which in themselves represent a huge volume of valuable sea food.

Of the 12 leading fishing ports of the world, landing annually a combined total of about three and three-quarter billion pounds of fish, Los Angeles and Long Beach together ranked sixth in 1934, with landings of 440,000,000 pounds, valued at \$4,400,000. The whaling industry along the California seacoast reaches considerable proportions; there being some twenty species of whales indigenous to California coastal waters.

Fish and wild life, given half a chance, have wonderful powers of recuperation even where their numbers are badly decimated by natural causes or the acts of man. Studies carried on by the Federal Forest Service, Bureau of Wild Life and the State Division of Fish and Game all over the State prove this. As an example, the almost one and three-quarter million acres of rugged mountain land interspersed with small valleys now included within the Trinity National Forest once supported several populous Indian tribes which lived abundantly on deer, fish and acorns. The depredations of hide hunters, previously mentioned in this work, had by 1905 so reduced the deer population that the native Columbian black-tailed deer was almost extinct.

About this time the area was included in a national forest withdrawal, the deer given a fair measure of protection, and commercial hunting stopped entirely. By 1915 deer were again fairly plentiful. During the hunting season of 1941, several thousand hunters enjoyed the sport of deer hunting, bagging 1,410 bucks. A total of 6,985 deer were legally killed by hunters in the Trinity National Forest during the six-year period 1936 to 1941.

#### Sub-Marginal Farm Lands

The lean depression years more than ever brought out the fact that a lot of the submarginal farm lands given away under our liberal land laws had better been retained in public ownership for combination wild life propagation and domestic livestock grazing. As a layman citizen investigator in the middle 1930's, Dr. Donald McKenzie Brown of the Santa Barbara State College includes the following in his statements of sub-marginal lands in relation to wild life.



"In the handling of agriculture on the public domain, the Federal Government.....under the Homestead Laws and the Desert Land Acts it has encouraged thousands of futile, sub-marginal farm undertakings - doomed to failure from the start. These have served only to ruin scenery and destroy grazing land, leaving them bare and useless for wild life.....

Contrary to popular impression the great army of hunters is not the chief reason for this sterility. The sportsmen must be looked upon as protectors of the game. Thru their organizations and publications they have fought those forces which destroy it. By payment of hunting fees they provide funds for the administration of the game laws.

The great destroying factor is agriculture.....Sub-marginal undertakings have been pushed into the remoter parts of the high Sierras. They not only do not pay, but their inferior produce depresses the market for the output of the richer valley lands. Water is diverted, springs dry up. Fires are set to clear the land, destroying young timber, and making way for inroads of useless chaparral. To save a few apple trees, the deer are shot down throughout the year. To protect a goat or lamb, bears are shot or poisoned. Distinction must be made between this type of subsistence farming and agriculture on fertile valley lands.....It is the scattered, poorly planned developments that take a toll of wild life out of all proportion to their economic value."

Speaking of the fight put up by veterans' organizations and other groups, and the tremendous public pressure brought upon the legislatures in the matter of having land laws cut to fit the insatiable land hunger of their membership, Dr. Brown said:

"When one examines great areas of public domain in eastern California and western Nevada which have been homesteaded under the 1916 law (stock-raising Homestead Act) and sees the landscape dotted for miles with abandoned shacks and ruined fences of former settlers, one wonders how any group of individuals could insist on such a folly."

The bitter fight put up by Uncle Sam's forest rangers in California against the listing of homesteads on unsuitable lands within the national forests for opening to settlement and entry has been previously recorded in this history. The old Forest Service reports are replete with statements such as "too high for successful agriculture," - "too rocky," - "too steep for successful cultivation."



A summarized report of the lands homesteaded in the national forests of California from 1906 to 1935 contains the following interesting figures:

Total number of all types of homesteads in national forests of California - 6,875.

Number of these homesteads occupied by original entrymen, 1,333, or 19 percent of the total.

Number of homesteads occupied by others, 1,710 or 25 percent.

Number of homesteads unoccupied and abandoned, 3,382, or 56 percent.

Total area of above patented homesteads, 775,000 acres.

Total area on these homesteads under some form of cultivation in 1935, 75,524 acres, or .097 percent of their total area.

The figures just preceding included forest homesteads - lands listed for settlement and entry under the Act of June 11, 1906 - as well as those filed upon prior to the withdrawal of the national forest areas and which embraced some fairly good agricultural land in the mountain valleys. With the last named type of homestead, the forest rangers had no quarrel but the 1935 review of the forest homestead revealed much sadder facts than even the prediction made two or three decades previously by the Federal foresters.

Back in 1920 it had already been recorded that out of 967 forest homesteads already patented, 194 had been abandoned and that only 16 percent of the area included in these homesteads was under any form of cultivation. The 1935 check-up showed that a total of 7,034 applications for forest homesteads in California had been made. In a great many cases the recommendations of the forest rangers were upheld, so that only 3,916 of these tracts were finally opened to settlement and entry and of those, 155 listings were recalled when it had been proven by actual test that they would not grow agricultural crops. Of the total area of about one-third of a million acres listed as forest homesteads in the national forests of California, in 1935 less than five percent was under cultivation.

On the Modoc Forest out of 96 tracts covering approximately 15,000 acres, thrown open to settlement and filed upon, only two places were being lived upon by the original entrymen 7 or 8 years later





and only one man was making a living off his claim. A large 1912 amount of land listed in the Tejon Pass section between 1906 and/ was entirely abandoned by the homesteaders in 1924. Twenty thousand acres of land was eliminated from the national forest in the Owens Valley section, snapped up by homesteaders, and there-entirely abandoned in a few years.

Southern California was a main center of forest homestead land listings, aided and abetted by land sharks who not only kept wires to Washington hot with their protests, but even appealed to the President himself with the complaint that the Forest Service was locking land away from possible development. In that part of the State efforts were largely directed to acquiring these public lands through the medium of homesteading for speculative purposes. One outstanding case fought by the Forest Service - and lost - was that of Dr. Homer A. Hanson, whose claim was located in Big Tujunga Canyon.

This tract of land, embracing 93.76 acres, was in no sense agricultural but the medico wanted it for a summer home. By consistent appeal to Washington he managed finally to have it thrown open to entry over the protests of the local officers. In 1923, at the end of 13 years, this homestead had a tiny garden 40 feet square, 3 olive trees, 9 peach trees, 4 fig trees, 2 walnut trees, 4 grapevines, one pear and one apricot tree. The doctor entryman did, however, have a very elaborate home which he used for week end parties. The local forest officers protested against the land being patented on the basis of its being non-agricultural in character and needed for public use - and again lost. The denouement came a few years later when Los Angeles County Flood Control District paid \$80,000 to get the doctor's homestead back into public ownership.

Several of the patented homesteads on the Cleveland National Forest covered 740 acres. After the lands were patented there was no pretense made of farming them. In 1925 this 740 acres of mountain land was valued at \$200,000 for recreational purposes.

One 100-acre forest homestead in the San Jacinto Range never produced ten dollars worth of agricultural crops but it had a high value for recreational purposes. In 1928, the entryman sold 90 acres for \$18,000 to a real estate firm who in time subdivided it into 45 five-acre summer home tracts which it sold for \$1350 each, or for a total of \$60,750. The speculative homesteader sold 7 of the 10 remaining acres for \$1,000 per acre, and still valued the remaining 3 acres at \$10,000.

Up and down the State the forest homestead story was the same - either sub-marginal land with no true agricultural value or sharp



speculators literally moving heaven and earth to acquire a piece of reserved land for any purpose except that intended by the Homestead Law. Over the protests of the public mountain land guardians, the government in general upheld the policy of the inherent right of every U.S. citizen to take a chance on farming up to 160 acres of public land, and in one case gave away 3,000 acres in the Laguna Mountains in San Diego county, - lands which were not agricultural and which some day must be bought back by the government.

Ten years after homesteading ninety percent of the thousands of acres in the Sequoia National Forest listed for entry were abandoned. In the southern part of the Trinity National Forest, 252, or 72 percent, of the 348 homesteads allowed had been abandoned within less than a decade after being filed upon by optimistic homesteaders.

Here and there, of course, was found a small tract of land, which could be made into a possibly comfortable family farm, and a few forest homesteads on the Klamath River bottoms were fairly successful due to there being plenty of available water. In the main, however, the position of homesteaders on public lands in the 20th century is pretty well epitomized by one disillusioned settler in the following rhyme:

How happy I am on my Government claim  
Where I've nothing to lose and nothing to gain,  
Nothing to eat and nothing to wear,  
Nothing from nothing is honest and square;  
But here I am stuck, and here I must stay,  
My money's all gone and I can't get away  
There's nothing will make a man hard and profane  
Like starving to death on a Government claim.

Then come to this country, there's room for you all,  
Where the winds never cease and the rains never fall;  
Come join in the chorus and boast of her fame,  
While starving to death on your Government claim.

Although the ink was hardly yet dry on some of the homestead patents covering California's third and fourth rate farm lands, with the New Deal administration in the saddle, plans were under way to return some of these lands to the public domain by outright purchase. Conditions in the poorer lands of the fertile Salinas Valley were so bad that local interests demanded official investigation by a Federal agency with a view to getting a lot of these lands back into Federal ownership. The job of investigation and survey was turned over to the Forest Service, altho business men's associations, chambers of commerce and county officials actively cooperated in the work.





After a casual survey of the Salinas River watershed, the forest rangers decided to confine their investigations to the wilder rolling hill lands on the upper reaches of the watershed in central San Luis Obispo county, an area of 84,300 acres lying between the higher mountains to the east and the bottom valley lands.

Although 57 percent of the area was held by non-resident owners, 27 percent by residents of the nester type, and 16 percent was public domain of such poor quality land that it failed to tempt even the most optimistic homesteader. The total assessed valuation of the private land area of 70,650 acres, including the improvements thereon, was \$335,000. For decades this section of the country was known in local parlance as "Poor Man's Hill."

Inhabited by scores of families, the thin topsoil on the flats and gentler slopes, produced fair dry farm crops for a few years before the prevalent sheet and gully erosion with its familiar consequences of topsoil loss began to really take effect. When the 1935 investigation was made only 2935 acres, or around  $3\frac{1}{2}$  percent, was under some form of cultivation; well over half was represented by chaparral covered slopes, the balance being oak woodland and open grassland.

The soil of the area was not adapted to commercial timber growth, the only timber use embracing fuel and fence posts used by the local residents. An indifferent silver mine, worked spasmodically, represented the only mining operation in the whole area. Periodic grass and brush fires sweeping over the region had added to the general devastation.

Easily accessible by good roads, this area was originally settled by land boom methods. No irrigation water was available other than that obtainable for a home garden by deep well drilling. Settlers in some cases built rather substantial homes. All diligently cleared such parts of their lands as were not too steep for possible cultivation, planted orchards, acquired a few head of livestock and raised grain hay for forage.

In 1935 the usual place had a flock of chickens and turkeys, an indifferent family garden and orchard, and an eroded field or two devoted to growing sparse grain forage crops or used for pasture. The climate was typically central Californian, with hot, dry summers and too much soil lashing rain coming all at once during the winter months.



That year, of 116 of the farm units checked by the investigators, 59 were occupied by resident families, 5 were occupied occasionally purely for hunting or recreation by outsiders, and 52 were definitely abandoned to the encroaching wilds. Many of the unchecked places had been abandoned also.

This Ponzo Unit, as it was called, was a very typical California rural community of the sort generally located on sub-marginal lands. Practically all of these hill farmers secured their family living from outside work, supplemented with such food stuffs as these lands would produce. The cash income of the average family was around \$500 per year and in 1935 about two-thirds of the adult male population were on work relief rolls.

It might be indicative of the rugged American independent spirit of these wrestlers with sub-marginal farms, that of 60 personally checked by the investigators an amount of only \$11,573 in land and chattel mortgages was outstanding against their holdings and singularly enough, there was only \$1,152 in delinquent taxes against the entire tract in 1935.

An occasional family scrabbling for a living on these hillside farms attained a certain measure of success in that at least they made a livelihood without the necessity of going on public relief rolls. One old gentleman in his seventies was found who had even saved a small cash surplus but his low living standards and struggle with the unkindly soil made him a living prototype of Edwin Markham's "Man With The Hoe."

Good husbandmen all, the most prosperous of them in no way resembled the upstanding independent farmer whom in our minds we associate with all that is best in American agriculture. It need hardly be said that although they were found in large numbers on the fertile acres not far distant, there were no Japanese in evidence on the Ponzo unit lands.

The entire area was an excellent game country, both for deer and upland birds. In fact, struggling farmers sometimes fell afoul of the law when they knocked over a deer occasionally for the purpose of family meat and to stop depredations of these animals in their gardens and orchards. The area was so well served with auto roads and so relatively close to populated centers that urban deer poachers were a real problem to the game wardens and local foresters.

Considering its value mainly from a game propagation and public shooting standpoint, the forest rangers recommended public



acquisition of the private lands in the Pozo unit, with the exception of 1,200 acres of bottom land which was adapted for indefinite intensive farming as its highest use. In addition to the public value of the game resource, the area would provide profitable grazing for 1,200 cattle, representing a production value of approximately one-third of a million pounds of beef on the hoof annually and pasturage fees into the public pocketbook of some \$1,500 per year.

In addition, there was a not inconsiderable potential recreation value in the matter of fishing, leased summer homes and hunting lodges if and when proposed water development for irrigation of the bottom lands was carried out. The Federal foresters, however, wanted the purchase put on a strictly business basis and while local officials rated the average value of the lands at \$9.94 per acre, the foresters set a top price of \$7.56 per acre. Undoubtedly, this purchase will some day be consummated at an even lower price than the forest rangers' figures.

#### The Public Domain

In March, 1935, President Roosevelt's Executive Order withdrew all public lands from private entry and stopped at last the lavish policy of giving away the public domain. Some years later, this Executive Order was somewhat amended when the Secretary of the Interior, custodian of all the unreserved public domain, was authorized to act for the President in the withdrawing or reserving public lands from certain forms of use with the proviso, however, that the Secretary could not act in such matters without the approval of both the Attorney-General and the Director of the Bureau of the Budget. This amendment further provided that no disposition of lands under the control of any other government agency could be made without the approval of the head of such agency. If this should sound a bit complicated, it merely meant that no more public land was available for individual entry under the various land laws of the past.

Even up to the time of this writing final title from the government to entrymen has not passed in all cases and the General Land Office still has a sizeable job in the final disposition of land entries, - cases of non-compliance with the law, errors in original filings, and other complications inevitable in land deals involving millions of people. Several hundred adverse reports against land patents in the public land states were made in the fiscal year of 1941. The authors are indebted to the Commissioner of the General Land Office at Washington and to the field office of his organization in San Francisco for the following figures showing final disposition of California Federal lands passing into private ownership.





DISPOSITION OF FEDERAL LANDS IN CALIFORNIA UNDER  
VARIOUS LAND LAWS UP TO JUNE 30, 1943.

Land and Scrip granted to State for educational and other purposes - Internal Improvements, Surveys, University Public Buildings, Common Schools (Secs. 16 and 36 or Indemnity Lands), Agricultural and Mechanical Colleges, State Park System.....	8,620,700	acres
Coal Land Entries from passage of Act of March 3, 1873	5,535	"
Desert Land entries from passage of original Act of March 3, 1877.....	1,074,600	"
Original Homestead Act under which the entrymen elected to meet full residence requirements of the law.....	7,025,000	"
Original Homestead Act in which entrymen elected to make cash payment in consideration of reduced residence requirements.....	1,360,000	"
Reclamation Homestead Act of June 17, 1902, by settlers on Reclamation Projects.....	30,000	"
Forest Homestead Act of June 11, 1906 - Homesteads inside	195,000	"
Enlarged Homestead Act of February 5, 1909 under which an entryman was allowed to take up 320 acres instead of 160 acres allowed under original law.....	990,000	"
Stockraising Homestead Act of December 29, 1916 which allowed an entry up to 640 acres.....	1,764,000	"
Timber and Stone Act of June 3, 1878.....	2,897,000	"

The above represents a total of almost twenty-four million acres but does not include preemption entries made prior to the enactment of President Lincoln's homestead law of Civil War days nor sales of land under the Isolated Land Act. The railroads, as we know, were given almost twelve million acres, and then there was around eight and a half million acres included in the 618 old Spanish and Mexican land grants ratified by the U.S. Land Commission of the sixties.

The Indians came out at the little end of the horn as usual. In 1937 there were 132 Indian Reservations in California covering an area of 572,064 acres, of which 57,045 acres were allotted to individual Indians. This area of Indian holdings embraced 5,285 acres classed as excellent agricultural land, 8,448 acres listed as good farm land, and 18,593 acres designated as poor crop land. On these California Indian lands there was also 4,500 acres of good commercial timber.



The balance of the land left to the Indians was fit only for grazing use and some of it of a decidedly poor quality at that.

When the President's Executive Order of 1935 stopped all land entries on the public domain, in addition to the lands within national forests, national parks and national monuments, a total of 2,233,316 acres had already been reserved in California for special public uses as follows:

Oil Land Reserves.....	1,269,912	acres
Power Site Reserves.....	620,558	"
Public Water Reserves.....	189,693	"
Potash Reserves.....	90,324	"
Reservoir Sites.....	45,226	"
Coal Reserves.....	17,603	"
	<u>2,233,316</u>	"

While in a sense, the President's action was a case of locking the barn after the horse was stolen, there was still a residue of some fifteen million acres of widely scattered, unreserved public domain in California.

Although there was an expressed desire on the part of many Western stockmen that this public domain be placed under the jurisdiction of the Forest Service for administration in connection with the national forests to which it was often contiguous, the Department of the Interior was opposed to letting loose its hold on these badly misused lands. Since the main use of the lands was for livestock grazing, the Grazing Service of the Department of the Interior was established thru the medium of the Taylor Grazing Act of June, 1934.

The grazing policies of this new government agency were patterned much after those of the Forest Service, the basic qualification of the permittee being prior use of the lands for pasturage during a period of years. However, ownership of dependent improved ranch property was not a prerequisite for securing grazing permits, the new authority recognizing rather range-controlling factors such as the ownership of water, without which the surrounding public range could not be used. On a gross acre of 8,072,000 acres, 675 permittees in 1941 grazed for portions of the year 73,292 cattle and horses and 236,376 head of sheep and goats, for which they paid pasturage fees of \$33,370, half of which under the wording of the law was turned into the State treasury.

The great long untended public domain was under administration at last, no longer a "no-man's" - or "everyman's" - land. Not only was grazing of livestock put on a controlled basis, but the new





Grazing Service was improving the eroded, badly overgrazed range by the construction of stock-watering reservoirs, building of drift fences, rescoding of particularly trampled-out areas, and carrying on such activities as control of range destroying rodents. In California, the bulk of the use of the public domain range was by stockmen who grazed their livestock on the national forests during the summer months.

### Uses of the National Forests

Range management, handled in conjunction with wild life administration continued to be a leading activity on the national forests of California. However, the primary purpose of the national forests was, and is, the growing and protection of timber and watershed cover. The Federal foresters also knew their ranges were somewhat overstocked, partly a hangover from the overstocking process carried on during World War No. 1. Several drouth years accelerated this and moreover, they grimly hung on to their belief that it was better to send two fat animals home from their ranges than three thin ones.

A gradual reduction of numbers took place between 1933 and 1941. In the first named year 141,642 cattle and horses and 364,485 sheep and goats were grazed on the national forest ranges of California; in 1937, a total of 135,424 cattle and horses and 329,000 sheep and goats; in 1941, pasture was provided for 125,962 cattle and horses and 289,677 sheep.

The above figures cover only animals over six months of age and do not include many thousands of head of livestock grazed on intermingled private lands, the supervision of which was turned over to the Federal forest agency.

Reductions in numbers were made gradually and on a sliding scale basis so as to disrupt the livestock industry as little as possible. Still sticking to the principle of the greatest good to the greatest number of people - the guiding star of Federal forest management - the 1939 figure for local cowmen holding paid grazing permits show 708 stockmen grazing 1 to 40 head of stock; 411 from 41 to 100 head; 248 running from 101 to 200 head, and 140 grazing over 200 head.

The multiple use policy of California's national forests entered into the life of many residents. Special uses ranged from apiaries, fish ponds and pastures to residences, stores and filling stations. Approximately 100 different uses of land were involved. On June 30, 1941 there were in effect 11,968 of these special use permits, 8,333 of which carried an annual rental charge, and 3,632 which



were free because of their use in connection with irrigation or home building enterprises.

These special uses of public forest lands covered 181,800 acres, and involved a length of 5,014 miles. In addition to special use permits issued by the Forest Service, there were 181 power licenses in effect on the national forests of California, issued by the Federal Power Commission, involving the use of 15,743 acres and a mileage of 1,816.

The Forest Service continued to acquire timberlands, either cut-over, or comprising tracts of more than ordinary public value, thru the medium of the Land Exchange Act, the cumulative total of such amounting to 947,000 acres by the end of 1941. These acquisitions of private land did not materially change the area within the national forests, since such land transactions as transfer of lands having national park or national monument status from the Forest Service to the Park Service just about offset the lands acquired by the former.

Generally, speaking, land exchange work of the Forest Service was not characterized by the long drawn out delays sometimes marking the course of governmental land transactions. An illustration of this was the speed and direct action with which the matter of a site for the great Palomar telescope was cleared.

It was decided by the California Institute of Technology to build the largest and greatest telescope in the world. After months of investigation it was agreed that the best possible site for the great scientific observatory was the summit of Mt. Palomar, in the heart of the Cleveland National Forest. There was no question that there could be any possible higher use of land than this and the Forest Service stood ready to issue the necessary special use permit for the needed lands. The sponsors of the plan, however, felt that in view of the immensity of the scheme and the millions of dollars of investment involved they should have full title to the selected site of 1400 acres.

This land lay at an elevation of 4600' to 5900', and its fair value was agreed upon as \$9,755. The California Institute of Technology offered 1,147 acres of land, valued at \$9,782 in exchange. The offered private lands were typical southern California watershed protection, were also within a State game refuge and included 40 acres of valuable public camp ground area. The land exchange transaction, initiated in the first quarter of the year, was all cleared up so far as the Forest Service was concerned by the mid-months thereof and the telescope builders experienced no delay whatever in carrying on work of completion of this 500-ton, six million dollar telescope, which extends the scope of the human eye 600,000 times.



## Rural Land Fires

As California's population and highway travel increased, rural land fires, - timber, brush, grass and grain lands - became more and more of a threatening menace. Not only tourists and newcomers to the State but a large majority of local urban residents, used to bare, concrete ground cover, failed to realize the flashy, easily-ignited type of California's vegetative growth during a large portion of the year.

In the calendar year 1940, Federal, State and county agencies fought 3,449 rural land fires which burned over 205,424 acres and caused a monetary damage of \$934,000. This was below the five year average of 1936-1940, records showing 3,972 rural land fires in the State burning over an area of 384,000 acres annually. The average area of forest and woodland under some form of organized protection during this fire year period was 29,256,000 acres. In 1940, almost two million acres of high fire hazard lands still had no form of organized fire protection.

One fire alone, starting on the San Bernardino Forest in late November, 1938, caused a damage loss of almost a million dollars. This fire, which started from a mountain residence and destroyed the world-famous Arrowhead Springs resort, exploded over thousands of acres of watershed cover in three or four hours, and was typical of fires in the southern California section, where the fire hazard some years is almost as great at Yuletide as in mid-summer.

The seriousness of California's rural fire hazard and the values at stake was responsible for the great expansion of the California State Division of Forestry and its smaller model in several of the more popular counties. The State Division of Forestry had become mainly a rural fire department and while its chief function was the prevention and control of wild land fires, much of the State forestry agency's efforts were also expended in handling structural fires outside incorporated towns and cities. Within a few years its fire-fighting equipment had grown from four trucks to over 500 motor vehicles, 250 of which were the latest word in fire fighting trucks, manned by a highly-trained personnel. Forest fires, brush fires, grass and grain fires, and oil land fires were the common daily lot of the State's foresters.

In 1941, the State Division of forestry was functioning in 33 of the 58 California counties, protecting some thirty million acres, much of it valuable farm lands. In some of the smaller urban centers, it maintained a cooperative fire-fighting organization and in a sense, its personnel became city firemen as well.





One of the big jobs of the Division was carrying on educational campaigns in schools and among service clubs and similar organizations. Always its personnel worked in close collaboration with the Federal Forest Service responsible for protection of the higher-lying timberlands and watersheds. The California State Division of Forestry, with little actual forest land of its own, by 1941 had become one of the leading State forestry organizations of the nation.

Great progress was made during the 1933-41 period in forest fire protection by the United States Forest Service, very much accelerated by the scientific studies carried on by the California Forest and Range Experiment Station. The work of these forest scientists in the realm of forest fire protection was invaluable, their findings being merged in the every day practices of the forest rangers on the ground both in fire prevention matters and in fire-fighting technique.

The use of water as a fire-fighting agency, useless in horse and buggy days, came more and more into vogue wherever fires could be reached by truck. Different types of tank trucks, equipped with pumps and hose were developed along the lines of the State forester's equipment. Where no permanent water existed, underground concrete tanks were sometimes constructed, being filled by means of runoff during the winter from a prepared asphaltum surfacing laid on the ground surrounding them. Of course, the area reached by means of water fire fighting was relatively very small and the special trucks available pitifully few.

In one congested rural urban area of southern California, a prominent conservationist ran for Congress during the latter thirties. One of the planks in his platform involved the laying of pipe lines over thousands of acres of steep, brush-covered hillsides forming a huge sprinkling system to be turned on in case of fire. His idea is not so fantastic as it might sound when it is realized that county officials of that same section rated these dense, bushy watersheds as having almost the same per acre value as the orange orchards below them.

Radio was a Godsend to forest fire fighters. Used not only in reporting fire occurrence, but in communication on actual going fires as well it solved the problem of quick communication. Mobile units, accurately forecasting local weather conditions in a fire area, not only rendered signal service in connection with forest fire control but proved a boon in disseminating weather information in rural communities during some emergency. L.G. Gray of the Weather Bureau, spending years expounding the virtues of these truck forecasting units, was able to prove their high value on several bad forest fires in the thirties.



Incidentally, practically every forest fire lookout and ranger station became a weather recording and reporting station, greatly strengthening the accuracy of meteorologists, in making weather predictions now so much depended upon by agriculturists and others.

Besides the different types of psychrometers used to record the relative humidity of the air, there came into common use the fuel moisture stick which, as its name implies, was merely a gauge of the moisture in the ground cover. The fuel moisture, or in other words, the degree of dryness of pine needles or other forest floor cover was indicated by laying a thin slat of seasoned ponderosa pine wood in a shady place on the ground and then weighing the same on specially-designed scales. The weight was indicative of the dryness, or moisture content of the ground cover. The forest ranger, from an outlying portion of his district, could call one of his guard stations by portable radio and learn instantly the current degree of fire risk in any particular section.

The use of airplanes had become quite common in forest fire control. As a means of detecting fires they were not too successful because of the short period of time the airplane was over any one area. They were invaluable, though, in making a reconnaissance of a going fire and in transporting overhead personnel over long distances on hurried fire calls. Dropping of supplies and equipment by parachute enabled the fire-fighting forces to maintain camps close to fire fronts. Water, food, radio equipment, camp equipment and fire-fighting tools were dropped in outlying locations. Even cases of eggs were dropped as regularly as other foods usually without the breakage of a single egg. Parachuting of firefighters, used in the more isolated mountain regions farther north, had not been resorted to by California foresters, mainly because of the greater volume of manpower required on California fires.

Bulldozers or trail-builders were quickly swung into action on most major fires, the heavy machines tearing wide fire lines through brush and timber across the path of advancing flames. Expert operators sometimes worked these mechanical monsters so close to the fire that the paint was scorched off them. They proved of high value particularly in the brush fields of the southern part of the State.

The hand flamethrower, which had long been a familiar contrivance in the backfiring operations so necessary in large scale fire fighting, was improved upon with the development by the California Forest Experiment Station to the extent that it was power operated, the unit with its supply of motor fuel being hauled on a specially-built light trailer.





Los Padres National Forest officers went still further and, reducing the size of the outfit, made it transportable and operative from the back of a pack mule for use on fires accessible only by trail travel.

As has been stated, the CCC provided the first dependable source of organized man-power available for rural fire fighting in major outbreaks. Prevention of fires was perhaps a bigger job than actual suppression. One of the biggest physical projects undertaken in the hill lands of the State was the Ponderosa Way, a road project launched by the Regional Forester of California during the early days of the CCC history. Forming a combination forest administration and fire control road from the Shasta country on the north to the region of the giant Sequoias on the south, it extended 600 miles along the higher foothills of the Sierra Nevada in the zone of contact between the ponderosa pine and the chaparral and woodland species lying at a lower elevation.

The Ponderosa Way took advantage of all existing roads. In some few places it was actually a main paved highway, in others a high standard county road, while in still other sections for mile after mile, it was merely an ambitious secondary dirt road, constructed to Forest Service standards. Briefly, the Ponderosa Way formed a firebreak 100 feet wide with a road in the center through the higher-lying foothills almost the entire length of the State of California.

This road is a distinctly multiple use project, providing a route of mountain travel between Pit River on the north and Kings River on the south; a firebreak as a measure of protection against the common occurrence of fires sweeping from the lowlands into the valuable pine timber stands; and a big transportation factor in the administration of the national forests of the Sierra Nevada.

It was natural that, in the matter of fire prevention, there should be a tightening up in law enforcement activity. More and more citizens, careless with fire in the outdoors, were taken to court. there to tell their story to the judge. In the case of man-caused fires, the duty ranking next in importance to the suppression of the fire was to apprehend the person guilty of its occurrence. While the volume of fires caused by human agency on rural lands in California represented a rather startling figure, there was a notable decrease in their number in relation to the number of people making use of the lands on which these fires occurred.

It is perhaps somewhat amusing to note the different official attitudes towards man-caused fires over a period of years. The



old Forest Service Manual of 1902, in its instructions to rangers, set forth:

"When an inexperienced person has built a fire against a rotten log merely to cook a cup of coffee, or where the fire is on a mass of dry stuff, the forest officer should call attention to such a mistake and instruct the person in the proper way of building and handling fires."

On some of the national forests of California to which this advice applied, open camp fires were banned entirely some years later.

In 1933, of a total of 1,252 fires occurring on the national forests of California, 826 were controlled before they reached one-quarter of an acre in size and only 135 burned over an area of ten acres or more. That year, 923 of the total number of these, 1252 fires were caused by human agency, the main class of individual responsible being the careless smoker. The area burned over in California national forests in 1933 was 101,839 acres, with a damage figure of \$134,666.

In 1941 there were 1,615 fires within the national forests of the State, burning over 103,432 acres and resulting in a damage of \$99,960. This was one of the State's bad lightning years, 847 forest fires resulting from this cause as against 768 caused by human agency. Of the 1,615 fires, 1,120 were controlled within an area of one-quarter acre, or less, and 133 of the total number covered an area of over 10 acres before being brought under control.

During the years 1933 to 1941 the Federal Forest Service was responsible for fire protection of an average annual area of approximately 25 million acres of forest land, embracing publicly-owned and intermingled private lands - or more than one-fourth the entire land area of the State. These lands included the important watersheds of the State, embracing millions of acres generally known as the "explosive" type of vegetative cover.

### Forest Values

The leading place of forest lands in the economic life of California is aptly illustrated in the figures previously quoted of an increase in the lumbering business for the State of from forty-nine million dollars in 1936 to eighty-one million dollars in 1941. The timber cut on national forests in 1935 totalled 111,669 board feet, which cost operators \$231,252 in the tree. In addition, that year around ten million board feet of timber, representing dead wood and diseased trees removed to improve the forest stand,



was cut under free use by local farmers and residents. In 1941, the timber cut by commercial operators on the national forests of California amounted to 438,240,000 board feet, having a stumpage value of \$871,434.

Private enterprise owns about half of the total commercial timberlands of the State. Since these lands were taken up mainly under the Timber and Stone Act, the choicest and most easily accessible tracts of timber were first selected, so that about 60 percent of California's timber stand, estimated at 213 billion board feet in 1940, is in the hands of private owners. These private owners that same year had around 500 million dollars directly invested in the lumbering industry, besides other investments serving the communities in which the lumbermen carried on their activities. Over 85 percent of California's total cut of timber came from private lands during the 1933-1941 period.

California's total lumber production in the year 1935 is given at 1,356,520,000 board feet. In 1941 the official figures show a production of 2,329,624,000 board feet, of which 50.5 percent was ponderosa pine; 19.5 percent redwood; 12.8 percent sugar pine; and 10.8 percent white fir, these four main lumber trees producing 93.6 percent of the State's total production.

Manufactured California forest products in 1937 totalled \$31,266,000, and plants employed an average of over 27,000 workers to whom \$23,441,000 was paid in wages that year. In 1939, the California Forest and Range Experiment Station, while listing 177 sawmills producing lumber, also listed 737 manufacturing plants processing paper products, planing mill products, furniture, boxes, and similar furnished wood materials. The combined value of the output of these plants that year was \$173,600,000. The number of workers was 37,900.

Although the redwood belt of California occupies a strip of land along the sea coast from Oregon to Monterey Bay 97 percent of the redwood lumber industry, is located in the three coastal counties of Del Norte, Humboldt and Mendocino. This Redwood Empire, as it is commonly called, is scenically of primary national interest and constitutes a definite economic land unit of its own. At the request of the National Resources Planning Board it was made the subject of a special study during 1940 and 1941 by the California Forest and Range Experiment Station of the United States Forest Service.

The total area of the three counties is 5,155,000 acres and the foresters' research disclosed that 1,569,000 acres of this was mature timber, one third of which was in pure redwood stands.





Back in 1850 statisticians of that time estimated the stand of redwood at 50 billion board feet. The forest investigators of 1940 placed this volume at 34 billion board feet. The original stand of redwood timber, they cited, covered 1,219,000 acres of which 62 percent remained in virgin timber, 9 percent had been cut over and gave promise of a good future stand of timber, and 29 percent had been denuded and was not restocking. The volume of mature timber of all species was placed at 57,350,000,000 board feet.

The foresters' analysis showed an annual production of redwood of approximately one half billion board feet for the years 1905 to 1929. This annual production of lumber of all species in the Redwood Empire dropped to an annual average of 341,244,000 board feet for the years 1930 to 1939. The production had a value of \$10,327,123 a year during this period, and was 85 percent redwood and 15 percent other species, mostly Douglas Fir.

The population of this interesting segment of the State in 1940 was 78,421, of which 32,149 were urban, and 46,272 rural. People actually living on farms numbered 18,227. Not all the big redwood belt was forested since 103,644 acres produced crops in 1940 and the value of farm products for the three counties in 1939 reached a figure of \$10,327,123. Incidentally, the foresters learned that 1,721,600 recreation visitors enjoyed this area of big redwood trees in 1940, leaving tourist money to the amount of \$6,025,690 in the three counties, and that the fish landings, from whale to mackerel, had a value of \$493,324 in 1939 and \$633,376 in 1940.

Lt. Colonel Geo. P. Ahren, writing on the subject of forest bankruptcy in America in 1939 pointed with alarm to the lavish use of timber in California. This writer mentioned California's original stand of timber as covering 23 million acres and stated that, in 1932, only 11 million acres of old growth was left. He gave the annual growth as 196 million board feet as against a four billion board foot annual cut.

Col. Ahern's concern was echoed by the nation's forest land-using agency, the Forest Service. A detailed survey was made and statistics compiled by the California Forest and Range Experiment Station in 1940. The figures of the Forest Service based on detailed data secured from all forested areas of the State.

The following are excerpts from the opening pages of the technical foresters' report:



"Of the State's total industrial payroll, from 10 to 15 percent is paid by the lumber and wood products industries, which directly support about 175,000 people....Altho our (California's) commercial forest lands are only a mere 3 percent of the Nation's total, these same lands bear 12 percent of the country's sawtimber stand. As number three state in lumber production, California carries more than its share of the load, and so great is the burden that its timber budget of balancing growth is badly out of kilter - in fact, the ratio of growing one board foot of sawtimber for every six that are removed is the poorest in the land.

"Also classed as forest lands, altho non-commercial, are the woodland and chaparral-covered slopes of the southern California mountains whence comes the vital life-giving water for the citrus industry .....

"In private ownership there are nearly 18 million acres of non-commercial forest which include pinon-juniper stands east of the Sierra, and oak woodlands along the western Sierra foothills, as well as the critical chaparral water-yielding lands of the coast range. Nowhere else in the country are non-commercial forest lands as valuable as in California, where estimates of their worth have run as high as \$950 per acre on certain critical areas. The agricultural economy of southern California would collapse without this forest land which makes it possible to put more water to work!"

The impartial figures of the Federal forestry experts showed the annual per capita consumption of timber in California to be 566 board feet, as against 248 board feet for the nation as a whole. Of this local consumption, 33 percent was derived from within the State, 65 percent from other states and 65 percent from foreign imports. Of the lumber produced from California lands, 67 percent was consumed within the state, 28 percent shipped to other states and 5 percent was exported to foreign markets.

Eliminating such products as cordwood, and speaking in terms of sawtimber only, the foresters' report showed the total annual growth in the redwood region to be 76,700,000 board feet, and in the pine region 337,500,000 board feet, or a total of 414,200,000 board feet for the State. Against this renewal of natural wood, the total annual drain by cutting was 1,647,100,000 board feet; by fire 110,500,000 board feet, and from insect loss 620,000,000 board feet. Some consolation was offered by the experts, however, when they set forth that with proper protection and management of the State's forested lands an annual renewal growth of sawtimber amounting to approximately 2,950,000,000 board feet could be expected, altho the new-grown wood would be somewhat inferior in quality to the old-growth virgin timber.





The fly in the ointment of any sustained yield management of the State's forested lands was the fact, of course, that such a large portion of the best of them were in miscellaneous private ownership - in small parcels - not only a State but a national factor in forest economy. The voluminous 1933 report "A National Plan for American Forestry," brought forth in response to Senator Royal S. Copeland's Senate Resolution 175, declared: "Practically all of the major problems of American forestry center in, or have grown out of private ownership." Incidentally, this detailed publication currently referred to as the "Copeland Report," was characterized by Chief United States Forester R.Y. Stuart as in many respects representing the most comprehensive and exhaustive survey made of the forestry situation in the United States up to that time.

Trees are woody plants which should be harvested periodically the same as other crops, with a provision made for future returns. However, it takes 50 to 75 years to grow a fair-sized lumber tree. Selected cutting to harvest a crop of timber every thirty years or so from a tract of land and thus provide for the perpetuation of the tree crop was a difficult matter for private timberland owners seeking to retire their heavy investments in sawmill plants, transportation and logging equipment. The tract was usually, therefore, cut clean and became non-revenue producing land for someone to worry about during the next half or three-quarters of a century.

Public ownership alone at that time could afford to hold these lands for the use of future citizens of the commonwealth; the period of waiting was too long for the private owner who generally could not afford to carry on his books non-producing land which could not be classed as an asset. He had already realized on his investment and taken from the land any values it held for him. Cut-over private timberlands were becoming a big economic and forestry problem in California.

By the third decade of the 20th century, industrial timberland owners themselves pretty well believed in the policy of proper timberland management expressed by sustained yield, selective cutting and a perpetual land use of their forests. Usually they had witnessed the effects of "timber mining" on lands other than their own. However, from a dollars and cents standpoint they were generally unable to carry on what they knew were proper land use practices. By 1940, some few lumbering concerns in California, possessed of sufficient finances and ample accessible timber supply, were logging their lands on a sustained yield basis, thereby assuring a permanence for the community of which they were sponsors.



Many of the lumbermen were also professional foresters. The Weyerhaeuser Lumber Company, with immense land holdings up and down the Pacific Coast, gave foresters the preference in any woods positions, from plain fallers and buckers to logging superintendents. Wm. Price, chief forester for this company, made the public statement that the company's woods foremen were "foresters" and that its foresters were "lumberjacks," to illustrate his point that their vast timber operations were looked upon both with the eye of the forester thinking in terms of perpetual land use, and the lumberman engaged in the business for profit.

In the main, the best concession the great majority of operators cutting on private lands could make to practical forest land management was to provide better fire protection, control operations in the matter of tree-destroying insects, and practice less damaging logging methods, all of which would leave their stripped lands in better shape to produce a future crop of timber - some day. Applied to forests, the efforts of conservationists for approximately half a century had not altogether been lost in California.

### Sick Trees

Sometimes other than financial factors made sustained forest industry in a region impractical. The large, pretty much self contained county of Modoc, with a prosperous interrelated wild land and farm livestock industry - beef production, dairying and sheep-raising- seemed an ideal unit where permanent land use of the forest was an assured fact. In the early thirties adequate railroad transportation came to the vast, formerly isolated Modoc forests and ambitious lumbering ventures were launched.

There had also come to Modoc's magnificent stand of ponderosa pine some years previously the Western pine bark beetle, causing a loss of hundreds of millions of board feet of timber. By 1934, altho Federally-managed control operations had reduced the annual loss by as much as 75 percent, the loss in some of the best timber had ranged as high as 16 percent of the entire stand and had virtually cleaned out the pine trees on the more lightly timbered areas.

In the early 1940's the Modoc country was enjoying an era of prosperity, based on harvesting the bug-menaced timber, but ten, fifteen or twenty years will witness its end. Nature herself in this case has worked hand in hand with the lumbermen to force a cut-and-get-out method of timber harvesting. This comparatively big slice of California land will constitute a big economic problem of land use which many solved, with the dumping of cutover timberland in the lap of the public.





The pine bark beetle continued its ravages throughout the California pine region. California forest entomologists estimated that a total of eleven and one-half billion board feet of timber was killed by this scourge between 1926 and 1940, a very much greater loss than that occasioned by fire itself. In 1941, the forest entomologists knew just about where they stood with respect to the constant battle against these tree-killing insects, a detailed survey having been made by the Bureau of Entomology in co-operation with the Forest Service and interested lumber companies. This survey disclosed that 2,301,680 of forest land in the northern pine belt of the State was subject to beetle infestation, ranging from areas of very low hazard risk involving 6,680 acres, to moderate risk lands covering 1,019,540 acres, on up to high risk areas embracing 289,810 acres.

Up until the time when war man-power shortages checked them, control operations were carried on by the U.S. Bureau of Entomology and Plant Quarantine, the U.S. Forest Service and private timberland owners. Direct control, the methods of which have been previously described in these pages, proved an effectual check in some areas. This method was supplemented all over the forests where logging operations were being carried on by the sanitation-salvage system. Briefly, this meant that wherever possible loggers went out of their way to cut down and utilize any tree which was playing host to the bark beetle larvae hordes engaged in tunneling its life away. This method worked well where possible to put into effect and since the wood in the tree does not become sour-sapped or stained until two or three years after the beetles' attack, there was the additional advantage of its being converted into good grade lumber.

In 1910, there was received at Vancouver, British Columbia, a shipment of nursery stock from France. This was an expensive shipment for the forests of the Pacific Slope since with it came the White Pine Blister Rust, a fungus disease which attacks the white, or five-needled pines and Ribes (current and gooseberry bushes). Spreading thru the Canadian forests, it soon crossed the international boundary line into Washington and worked its way down into Oregon. In spite of control operations in the other Pacific Coast states and strict plant quarantine regulations at the California border, it slipped over into Del Norte county, where its presence was first discovered in June, 1936. Two years later, infected sugar pine trees were found in Plumas County, 160 miles south of the State's northern border. In 1940 white Pine Blister Rust was found some fifty miles still further south. By this time, however, control crews of the Bureau of Entomology, working cooperatively with the Forest Service, were well ahead of it, removing the mothering Ribes, without which it could not spread.





The disease can be transmitted only by the five-needled pines and Ribes, working in conjunction. Unfortunately, however, the victim of its attack in California is the great sugar pine, twenty billion board feet of which is growing on some two and half million acres of the State's pine forests. The fungus travels from the pine to the Ribes bushes and back again. If one or the other of the hosts is destroyed, the disease is licked. To save California's valuable sugar pine stand, a major battle was thrown into the lap of the forester entomologists.

Control work consisted of grubbing up gooseberry and currant bushes, both cultivated and wild. Later, the use of bulldozers speeded up the work since by the use of these tractors sugar pine trees up to a fair size could also be uprooted if the disease had already attacked them. Work was concentrated mainly on eradication of the Ribes well in advance of the spreading epidemic. The report of W.V. Benedict, senior forester in charge of the work in California, shows 3,000 men employed on White Pine Blister Rust control operations in 1940 and 1,030 men during the working season of 1941. By the end of the latter year on the approximate two and one-half million acres susceptible to the disease, initial Ribes eradication had been completed on 856,000 acres, and complete control reported on 366,000 acres.

Forest trees are subject to various ills, just as much so, perhaps, as the fruit trees in the farmer's orchard. In 1941, Dr. W.W. Wagoner of the Bureau of Plant Industry, working with Forest Service officers, investigated a suspicious dying of trees in the valuable Laguna recreation area of the Cleveland National Forest. The investigation disclosed a root fungus, (*Fomes Annosus*), hitherto unknown in California, altho quite prevalent in Europe. The only known method of preventing spread of this new tree-killing fungus is tearing the trees out by the roots and allowing them to dry out, a control operation not feasible in wartime where the timber involved, while having a high esthetic value, is not adaptable for use as lumber and wood products.

#### Reforestation and Forest Research

As might be supposed, with CCC labor available, forest tree planting operations were greatly speeded up. Covering the entire period of 1924 to 1942, a total of 25,819 acres was planted to trees by the U.S. Forest Service in California's forests, - a rather imposing figure of 9,261,800 individual trees. Half of these were Jeffrey pine, the other half ponderosa pine. Besides planting, 4,628 acres were sown with seed, altho foresters have found that seedling transplants constitute the much better method of reforestation.



On plantations five years or more old established between 1924 and 1942, there was a 62 percent survival by the latter year, sufficient to give fair assurance of future pine forests on the lands involved.

The University of California stands as a focal point of the State in directing research dealing with California rural land use. This section of the great university houses the California headquarters of the Bureau of Entomology, the Agricultural Extension Service and the California Forest and Range Experiment Station, as well as the classrooms and offices of the university's forestry school, now considered one of the biggest and best in the entire world.

As previously mentioned, the Agricultural department of the University and the varied land use research activities emanating therefrom were made possible partly by the generosity of the great banker, Amadeo Peter Giannini. It might be stated in passing that by 1941 Giannini's banking system had expanded so that it included 500 branches in towns and villages all over the State. It had 9,000 employees and one and one-half billion dollars in assets and part of these assets were represented by the ownership of half a million acres of fertile valley lands. It was quite natural, therefore, that the head of this immense financial organization would be intensely interested in all forms of use of the land which had made him one of the wealthiest men in the state.

As one of Berkeley's land use divisions, the California Forest and Range Management Experiment Station of the U.S. Forest Service played a leading part in forestry research and allied land use in California. Upstream flood control, centered in the Federal Forest Service by the Omnibus Flood Control Act and later amendments; forest genetics; studies of various kinds in connection with logging operations and timber utilization; range management and livestock production studies; forest biology, involving wild life propagation and management; forest type surveys and maps; soil stabilization and forest fire control research are only a few of the many activities in which this forest research organization is engaged, either individually or in cooperation with other agencies directing wild land use.

By the end of the thirties, these forest experimenters were carrying on their investigations on diversified selected areas throughout the State, their major project areas including the following:

Black's Mt. Experimental Forest, 9,000 acres in Lassen county, 20 miles northwest of Westwood.





Yurok Experimental Redwood Forest, 2500 acres in Del Norte County - 14 miles south of Crescent City.

Devil's Canyon Experimental Forest and Nursery, 2720 acres, just above the heavily populated San Bernardino Valley.

Feather River Branch Station, 4,500 acres, 4 miles north of Quincy in Plumas county.

San Joaquin Experimental Range, 4 miles southwest of O'Neals in Nadera county, embracing 3,650 acres of range land.

Shasta Experimental Forest, 1,500 acres near Mt. Shasta City.

Stanislaus Branch Station, 500 acres, 4 miles northeast of Strawberry, Tuolumne county.

San Dimas Experimental Forest embracing 17,000 acres north of Glendora, the watersheds of which extend to the floor of the Southern California Coastal plain.

Badger Wells Branch Station, covering 15,000 acres located in the heart of the beetle-infested timberlands of Modoc county.

Institute of Forest Genetics, 100 acres three miles northeast of Placerville, which constitutes probably the most wonderful tree experimental area in the West.

Swain Mt. Branch Station, 6,000 acres located two miles west of Westwood.

San Joaquin-Kings River Experimental Area involving 5,000 acres in Fresno county.

Altho the lands of the research division of the Forest Service might seem to be widely diversified and scattered, it must be remembered that while all other reservations of public land are made for a single purpose, there was never any deviation from the policy of multiple use in the administration of the national forests.

Most land crops are annual; forests must be thought of in terms of centuries, or at least decades of time. A lot of the work



of the California foresters must meet the test of generations yet unborn. Much of the research work of the Forest Service, however, had already borne profitable fruit, as in better methods of fire control, range management and use, timber utilization, wild life management, and in other activities connected with the multiple use of forest lands.

As the name implies, the work of the California Range and Experiment Station is a "show me" proposition. Actual experimentation, sometimes covering long years of research, must show by actual demonstration good and bad practices. When unsought war came to us almost overnight, much of the forest research work proved of almost incalculable value to the war effort. It was discovered too, that the much venerated scientific forestry practices of Germany, worked out through centuries of patient research in its handmade forests, did not overshadow and often did not equal, those brought into being in a few decades by the faster working practical forest scientists of California and America in general. Land users in the rich foothill agricultural area surrounding Placerville felt the urge to carry on range and timberland experiments of their own, untrammelled by scientific interference. The Forest Service obligingly catered to their desires by setting aside a section of public land in the Eldorado National Forest, since become known as the Gilmore Home Demonstration Area. The Forest Service said in effect to the local, would-be investigators. "Do just what you like with this land. Use twenty acres, or a square rod, to carry on any experiments you please, as long as you do not interfere with the other fellow's experiment or cause damage to surrounding lands."

This venture gained in popularity year by year as experiments were carried out on the land by different rural groups, even by the junior elements such as Boy Scouts and 4H Clubs. Posts of different species of wood were set in the ground to note their resistance to decay; different types of range grasses were tried out on the mountain area; controlled burning experiments were carried on and stockmen's organizations, in one exhaustive test, proved to their own satisfaction that pruning rather than burning of the native wild birch produced much more and better forage.

The physical contours of the land and the diversified vegetative cover makes this area well adapted to any form of experimental mountain land use. The Forest Service exercises control by the issuance of free permits for the use of the land by different groups or individual experimenters.



## Mines, Minerals and Miners

At the end of the 19th century the value of California's annual mineral production was 29 million dollars. In 1914 it was 94 million. By 1940 it had reached a figure of almost 342 million, and, stimulated by world war conditions, the 1941 mineral production had risen to a value of slightly over 374 million dollars. In 1941, fuels - petroleum, natural gas and a very small amount of coal - accounted for \$241,600,000 of this total, with an output of over 378 billion cubic feet of natural gas and almost 230 million barrels of oil.

Metals of all sorts had a value that year of \$61,895,000, gold being the leader with a production value of forty-nine and a half million dollars. With impending war, gold mining was starting to decline altho in 1939 a harvest of 2,359,776 ounces, worth almost 51 million dollars, marked the highest annual State production since the boom time gold mining era. The output of quicksilver and tungsten, both critical war minerals, was climbing, the production value of the former in 1941 being four and a half million and the latter a little better than four million dollars.

Industrial products mined from the earth of California in 1941 had a value of \$8,502,000, the leaders in the production list of this class of minerals being pottery clay, limestone, mineral water, gypsum, silica and soapstone.

The so-called structural minerals added almost fifty-two million dollars to California's mining output value in 1941, jumping from approximately thirty and one-third million in 1939 and from less than nineteen and one-half million in 1939. Cement was the undisputed leader in this class. In 1940, the State's output of cement was 13,995,255 barrels, valued at \$17,673,202. In 1941, this production volume had increased to 19,522,000 barrels, worth \$26,248,694. California ranked second among the states in cement production in the latter year, accounting for twelve percent of the entire national output. Miscellaneous stone ranked second in value among the structural materials mined or quarried, the valued output in 1933 being \$6,871,000; in 1940, \$12,181,000, and in 1941, \$19,600,000.

The minerals known as Salines - products mainly of the desert sections of the State - included borates, salts, sodas and a host of minor products such as iodine, potash and various magnesium salts. The salines production value in 1933 was \$8,652,000; in 1939, \$13,178,000, and in 1941, \$11,927,000.





Twelve plants, located in eight tidewater counties, in 1941 produced 434,237 tons of salt by the evaporation of sea water, their combined output having a value of \$1,181,000. California was not only the leading state in borax production, but also the leading world source of this saline mineral.

The wide range of California mineral production is illustrated by the fact that Los Angeles county alone, credited with 41 percent of the State's output of petroleum and 31 percent of its natural gas, was producing commercially twenty other minerals. In 1941, San Bernardino county was taking over fifty different kinds of mineral from the earth and that same year the State Chamber of Commerce lists almost one hundred different minerals being taken from California lands.

Ever since the gold mining days of Forty-nine, numbers of small, independent miners had worked claims throughout the California foothills and mountains. Often his mining claim was the only home the miner knew and afforded a very precarious livelihood unless supplemented by work elsewhere. Some of this class were small mountain farmers who worked a mining claim as a side issue, sometimes the mine being located on the hillside farm itself.

The average small miner of this class was a bachelor of the semi-hermit type, well along in years. Wedded to the land embraced in his claim, he preferred the less remunerative and more independent life of the mountains to spasmodic employment and cheap lodging houses in the city. Frequently somewhat eccentric, sometimes well educated, he was usually possessed of the independent, self-contained nature which mountains breed in men.

It would be an exaggeration to say that any of these small operators ever averaged over three dollars a day for days worked on their claims and such a day generally meant ten or twelve hours of gruelling hard work. Nevertheless, these small, independent miners stuck to their claims year after year, including a not inconsiderable number of Chinese laborers gleaning small, but to them fairly satisfactory wages, from old mining ground worked over many years before, but not sufficiently extensive or rich to attract large mining capital.

Almost anywhere in the famous Mother Lode region of California one can wash a miner's panful of dirt and get a glint of yellow gold. Ground which will run one part gold to one million parts dirt will amply repay mining operations even on a small scale, and is considered rich ground. The gold miners of the 19th century never passed up any large scope of land with such a degree of richness, but as would be natural over such an immense area, sometimes overlooked small rich pockets of gold.



The occasional finding of a small nugget in the California hills, worth perhaps anywhere from \$5 to \$25, or a small fragment of rich ground received reams of newspaper publicity and, conjuring up visions of the famous old grass roots mining days, added still more to the glamour of California's hills. Such incidents, in fact, were much more freely mentioned than the operation of the famous quartz mines of the Grass Valley section, heavy gold producers since the early fifties. Here in the great Empire Mine, running full blast in the 1930's, it took miners one hour and fifty minutes day way from the surface of the ground to the workings 9,400 feet below.

### 20th Century Argonauts

California during the thirties had a real second "gold rush" when thousands of unemployed took to the hills, many of them in an honest endeavor to stay off relief rolls and dig up or wash out sufficient gold to purchase the necessities of life. Moreover, the price of gold jumped from an average of \$20.67 an ounce in 1932 to \$35 an ounce in 1935. In the latter year, at one time, tens of thousands of amateur miners were re-working the beds of over 2,000 creeks, famous in the old gold mining days.

One checkup of these 20th century miners who had individually produced more than one ounce of gold and made more than one sale of the yellow metal, disclosed that these small operators had mined and marketed 29,517 ounces of gold, worth \$1,033,000. The individual reward, however, was small since the same investigation showed that the average income of these many thousands of miners was \$1.53 per day and that they had worked an average of only 58 days each. Furthermore, this return of \$1.53 per day often included the labor of the wife or partner of the man who actually marketed the gold.

The news that yellow gold could still be taken from the California hills spread like wildfire and more of the unemployed took to the mountains. The population of one mining county increased over 200 percent in two or three years. Handbooks on prospecting and placer mining were written by mining experts and became best sellers. The part dealing with per capita production was usually overlooked.

The authors of the mining handbooks were brutally frank, though, when they pointed out that a fairly industrious man could pan out around half a ton of material in a long day. Handling this amount of dirt, sand and gravel to produce \$2.50 to \$3.00 a day, they set forth, there would need to be taken three and one-half cents worth of gold from each panful of earth, fairly rich dirt, and seldom found.





They admitted that an expert miner could double or treble the amount of dirt handled, but the majority of goldseekers avidly studying these instructions were rank amateurs.

While some few of these modern Argonauts were itinerant adventurers, the majority were unemployed men in their forties, or older, many of them married and with families. A considerable number of them possessed that sense of American pride which bred a repugnance to such things as work relief rolls. While engaged in this new business of prospecting or mining, they lived in tents, abandoned cabins, makeshift shacks or even slept in their autos at or near their operations. One authority, making a survey of the mining areas, stated that the cars of these miners were, on the average, over ten years old.

In seeking out the gold there were three main classes of miners. Those called "snipers" worked ground that had been hydraulicked in years gone by. "Pocket Hunters" were those who searched the old mining grounds for possible natural caches overlooked in the more prosperous mining era. "Moss Miners" wove mats of lichen taken from livesak trees and suspended them across the stream below large scale hydraulic operations. When thoroughly soaked with slime, these mats were dried, burned and the ashes panned. Rarely was a profit of more than twenty-five cents a day per miner obtained by this last-named method.

Sufficiently often to keep hope alive in the hearts of others, pocket hunters found a small nugget or snipers a few square yards of rich dirt. One enterprising miner panned the dirt on the site of an old dance hall which had burned down years before in one of the old ghost mining towns. Its ashes proved "rich dirt", impregnated as they were by gold dust carelessly spilled from the pokes of miners three-quarters of a century previously.

The reward obtained by most of the amateur miners was better illustrated in the case of an unemployed city musician turned gold miner. He and his young wife worked diligently for months as "snipers" and jointly averaged a return of one dollar a day. A survey made in 1935 of thousands of miners showed an average return of \$1.60 per day for each including some working their own claims of many years ownership, and many who supplemented their mining activities by gardening or trapping.

There were no forest rangers in the California mountains in the days of "Forty-Nine." However, there never had been any ban on legitimate prospecting or mining in the national forests and the forest rangers of the 20th century were somewhat prone to look with an indulgent eye on the man who would put in long hours of toil washing out sufficient gold to buy his flour and beans rather



than live on some form of charity. Some of these modern miners were technically in trespass but the forest ranger very well knew that while any citizen could file a mining claim on public lands, getting title to the land meant showing that it was the basis of a mining venture sufficiently profitable to provide a decent livelihood for the claimant.

### Pseudo Mining Claims

Mining laws applicable to public lands in California had always been extremely liberal, a fact taken advantage of by land sharks fostering spurious land schemes. Thru the medium of the mining laws this class left no stone unturned in their efforts to secure title to public lands when such was not obtainable under the Homestead or other land laws. The efforts of these sharpers were greatly stepped up during the gold fever period of the thirties, but their rackets had become so well known that they met with indifferent success in launching any brand new schemes in land-grabbing.

The Forest Service records are replete with cases of pseudo mining claims in California, initiated by parties desiring the land for any other purpose than mining. The fact that a "color", - indicating the bare possibility of richer ground in the vicinity - could be found on almost any mountain stream in the State, added to the difficulty of uncovering these mining land frauds.

Always, in mining as in agriculture, forest officials were willing to issue a special use permit to an honest applicant, to prove or disprove his contention that the desired land was truly mineral in character. W.H. Friedhoff, mineral expert for the Forest Service in California, who spent a lifetime investigating 20th century mining claims in the mountains of the State, found very few which could be called mineral land.

In 1936, during the heat of the modern gold mining craze, L. A. Barrett, Assistant Regional Forester for the California Region of the United States Forest Service, prepared a summary of the status of mining claims in the national forests of the State. In this report the forester pointed out that mining laws had not kept pace with the times, some 72 outmoded laws passed in the 1870's being still applicable to California lands in 1936. It may sound strange to say that the expenses of the Civil War, as represented by the hundreds of millions of California gold, were paid for by stolen money. Yet this is in a sense true since the Forty Niners were all technically trespassers, the first law under which mining claims could be legally patented being the Lode Act of July 26, 1866.



Forester Barrett's report reviewed the Forest Service figures of 1926, a year in which California was fairly prosperous. These figures disclosed that out of a total of 5,346 mining claims checked on the national forests that year, 5,172, or 96.8 percent, were not being used. Of the total, 2,056 had been patented, naturally representing the best of them, but even of those patented claims, 1,796 were not being used for mining purposes. Out of the grand total it will thus be seen that only 174, or 3.2 percent were actually active mining ventures, since the balance of the patented claims were the subject of only occasional mining operations.

The survey included only those claims of record with the Forest Service, since as in the case of homestead claims, filing and the issuance of patent was handled through the General Land Office. This agency, always under tremendous pressure from landseekers, often overrode the protests of the forest rangers against the issuance of patents to claimants who had other uses of the land in mind. Of the 5,346 mining claims summarized in the preceding paragraphs, 161 were being used for residences or commercial uses, 500 for grazing, 1,042 for recreational purposes, 1,749 for timber, and only 1,894, or 35 percent, for any form of mining operations. The estimated value of the land embraced in the claims used for purposes other than mining was set at five million dollars.

It was estimated by the forester investigators that up to 1934 over 170,000 acres had been filed upon as mining claims in the California national forests with the intended use of the land other than mining. On 154 quartz claims, involving 3,080 acres, specially investigated that year, not a single paying mine had been developed.

Land sharks openly advertised for claimants, painting a cozy picture of outdoor life on a mountain stream. The promoter charged a fat fee for his services in locating a victim on a pseudo mining claim and instructing him in the necessary work he must do on his land to maintain possession. It took the Forest Service and public-spirited local Los Angeles citizens 20 years to stop one such schemer, Charles E. Brewer, and to land him in jail on swindling charges.

The International Gold Mining Company was a similar outfit offering mountain cabin sites thru the medium of filing mining claims, and carried on for years before legal processes stopped its sharp practices. N.M. Wymore of San Rafael had a profitable racket while it lasted. Filing on mining claims in the mountains of Shasta county, he established a boys' camp on the land to which he took groups of boys for a six weeks' outing at a charge of \$250 each. The Forest Service finally stopped him through court





proceedings on the charge of using the land for other than mining purposes.

A bitterly contested "synthetic" mining land case of the early thirties was that of the Nescal Placer Claim of 160 acres, located on the Big Pines Playground in the Angeles National Forest, an area where hundreds of thousands of metropolitan residents came to enjoy outdoor recreation each summer. When patent was applied for there were fourteen summer homes on the area, located on claims filed upon for a poor quality of unmarketable limestone. The claimants had jointly expended \$15,000 in recreational development and \$1500 in "gesture" mining. The landsharks back of the pseudo mining venture stood to profit greatly. On the protest of the Forest Service, however, the claims were cancelled by the General Land Office.

The Rosalie Placer Claim on the Lassen National Forest was also cancelled by the General Land Office after bitter protest by the forest rangers. There was a show of color in the dirt everywhere on this 80-acre claim, which was covered by choice timber. There was also a real gold mine, lacking only the gold. The claimant had overplayed his hand in erecting a sawmill on the land, selling the lumber manufactured from trees cut on the claim.

Another goldless mining property was the Alta and Eva Placer Mines on which the claimants maintained a trout fishing resort on the Feather River for some twenty years, their contention being that they were operating a gold mine. The General Land Office cancelled the claim after forest rangers proved that two expert miners, working hard for six hours on the richest part of the land, obtained only ten cents worth of gold.

A case involving good public fishing grounds, on the Feather River, was that of the Gansner Place, the legality of which was also contested by the Forest Service for twenty years. Altho filed upon under the mining laws, the claim was used mainly as a submarginal farm, indifferently cultivated and cropped if the season was kind. The claimant based his right to title on the fact that adjoining lands had been patented under the mining laws but failed to mention that these adjoining lands were not being used in any way for mining purposes.

On the northern national forest, a quarter section of land embraced two small lakes of more than usual natural beauty and afforded fine fishing. Gradually, as time and funds afforded, local forest officers were constructing a fair auto road to the area, building public camps and picnic grounds, and restocking the waters of the lakes and feeding streams with fish. Since the area was close enough that farmers and villages families could spend a restful



Sunday away from the valley heat and return home in sufficient time for their evening chores, the community labored with the Forest Service in the development of this sylvan retreat. The land in the vicinity was pock-marked with the workings of old mining claims long since abandoned as non-paying mining ventures.

On to this scene, exuding prosperity at every pore, stepped a typical land promoter. Armed with maps and full information on the area, he called on the nearest forest officer and insisted there must be some way by which he could secure title to the land. When plainly informed that the land was needed for public use he turned away, casually remarking, however, that such lands could be filed upon and held under the mining laws. When a couple of days later the promoter arrived on the land with his men to post mining claim location notices, he found other newly-posted notices staring him in the face and stating that the land had been withdrawn by the Government for a public service site.

The local forest officers had used the only weapon at their command for quick action. The land shark, knowing he was beaten, returned to his city haunts. The area is still admirably serving the local Grange, Boy Scout troops, 4H Clubs, farm families and the general public as a free recreation area. In many similar cases the tying up of public lands by mineral claim filing was forestalled by some such similar action of local rangers.

Development of public works such as highways and reservoir sites was so seriously held up by pseudo mining claims that in the early thirties the Commissioner of the General Land Office cracked down and cancelled many of the unpatented claims when they were protested as illegal by the mountain foresters. In one instance, Los Angeles paid \$135,000 for a group of mining claims which had already been patented in San Gabriel Canyon involving lands of very little value for any other purpose, but badly needed for a public reservoir site.

Investigating officers disclosed that one land locator had placed entrymen on 268 pseudo mining claims. Since the very minimum fee charged by such locators was \$50 per claim, this operator cleaned up a tidy sum.

A bitter legal fight was precipitated when the city of Los Angeles wished to build a reservoir in Boquet Canyon. Holders of 40 of these fake mining claims in that area asked the city a price of \$200,000 for the non-mineral lands on which they had located. The General Land Office cancelled the whole lot when forest officers proved their worthlessness from a mineral standpoint.





Often the claimants themselves were victims of a combination land hunger and the common ambition to own a gold mine, human frailties on which the business of the land sharks was built. John Berman, well known Los Angeles assayer, during the peak of the pseudo mining claim racket in the nearby national forest canyons, had this to say -

"For thirty years I have spent an average of perhaps two hours a day trying to save the sucker....with very few exceptions the sucker is part crook, or at least a subconscious crook. Always he is impelled by the hope of reward without work; always he is fearful of putting his hope to the test of merit before his money is gone in a glittering dream. A Sucker is always a person who invests without competent investigation."

### Petroleum Lands and Products

On a much larger scale were the sharp practices perpetrated on public State-owned lands in connection with California's immense, ever expanding oil industry. The Huntington Beach tideland oil pool was estimated to contain around 500 million dollars worth of oil. Oil companies, large and small, cast longing eyes on this vast reservoir of public oil lying beneath the State lands adjoining their own. In the thirties it was discovered that some of these companies, including the great Standard, were slant drilling into the public pool. Stopped by the authorities, the smaller companies were forced to reimburse the State.

The Standard Oil Company officials admitted having gotten the benefit of six million barrels of oil, worth about one dollar a barrel, but offered the State only 300,000 in settlement. The State authorities in general seemed willing to settle for 465,000, but Senator Culbert L. Olson, later State governor, held out for 475,000 - little enough for the value received by the huge oil corporation. While this dickering was going on, the Burns Bill, giving the Standard Company an almost complete monopoly of this largest public oil pool in America at an extremely low loyalty rate, slipped through the legislature. The public learned of the measure at the eleventh hour and their storm of protest had much to do with the vetoing of the bill by Governor Merriam.

In 1936, an initiative measure was handed the voters under the guise of a law to secure revenues from State-owned natural resources, the funds to be used for the development of public parks and beaches. Proponents of the measure made a lot of noise prior to the election date and spent a lot of money campaigning in its favor. Undoubtedly, there was just a little too much ballyhoo in



connection with the so-called "Save Our Beaches" campaign which had the same underlying purpose as the Burns Bill. The voters, suspecting a hidden Ethiopian in the woodpile, turned the proposed measure down.

California's output of petroleum continued to grow and grow. Oil was the undisputed monarch of the industrial world. Gasoline was making California over and changing the pattern of both urban and rural life, probably more so than in any other section of the country.

With a State tax of three cents a gallon, during the fiscal year ending June 30, 1941, California collected from distributors \$59,558,544.93, representing the tax on 1,985,284,831 gallons of gasoline. While other oil companies also paid enormous amounts, one oil company was away in the lead, with a tax bill of \$11,951,625 on 398,387,500 gallons of gasoline delivered to its customers.

The cracking process of refining gasoline from crude oil was a big conservation agent and added hundreds of millions of gallons of finished gasoline to California's output. Distilled at high pressure, the bigger molecules were shattered or "cracked" into smaller ones to produce a more volatile motor fuel. In 1910 the average yield of gasoline from a barrel of crude oil as it came from the earth was four and one-half gallons; in 1935 it was almost eight gallons. So great a difference existed in the relative quality of gasoline refined from the native product that a 1935 model motor could not be operated on the average grade of gasoline produced in 1910. In 1934, measured from a national standpoint, to produce 338,770,000 barrels of gasoline, 895,636,000 barrels of crude oil were needed. Without benefit of the cracking process, to produce this quantity of gasoline, it would have taken 1,687,370,000 barrels of the crude product. Up to 1935, experts estimated that seven billion gallons of crude oil had been saved the nation by the cracking process.

Naturally, there was a wide range in the quality of crude oil itself produced in different localities. In one field in Santa Barbara county, crude oil as it was pumped from the wells, when placed in the tank of a modern automobile rendered very creditable performance as a motor fuel.

One of the greatest strides made in the petroleum industry in connection with the betterment of rural living conditions was the development of liquefied gas, butane and propane, later marketed as industrial gas under such trade names as Flamo. Disregarding technical details, this liquefied gas is merely concentrated manufactured gas, highly compressed in stout metal containers in



the form of gas rather than liquid. So highly compressed are these liquid gases manufactured by different oil companies under various trade names, that while a pound of the product at normal atmospheric pressure will more than fill a 50-pound barrel, in its compressed, liquefied form, it will only partially fill a one-quart measure.

The contents of two of the most popular sizes of the heavy metal cylinders in which this type of fuel is kept weight 91 and 41 pounds respectively. The larger cylinder contains 780 cubic feet of gas available for use, the smaller 350 cubic feet. Two of the smaller containers are often packed on the back of a mule to the most remote mountain cabins for use as fuel or lighting where native wood is scarce. Transportable like so much cordwood or pig iron, the cylinders can be stacked up almost indefinitely without reducing the efficiency of their contents. One of the 91-pound containers, if used for cooking purposes alone, will last the average family a month or more.

Economical to use, in a section like California where the supply of raw material used in its manufacture was apparently unlimited, this new fuel became almost a standard in the rural sections. In many parts of the State this "bottled" gas furnished the same number of heat units per dollar as did electricity at one and one-half cents per kilowatt hour. Housewives generally attested its superiority over wood or coal for cooking, from the standpoint of cooler homes in the hot summer months and less muss and fuss; and to the boy of the farm family, the yawning, perennially-empty woodbox was often a thing of the past.

Not only did this new fuel come into general use in the remotest valleys of California for cooking, heating, mechanical refrigeration and lighting purposes for the comfort and convenience of the home, but also filled many industrial rural needs such as concentrated fuel for propelling motor equipment, welding, soldering and the like.

Since there were 1,900,000 consumers of natural gas in California in 1941, only 5,300 of which were industrial users, added to those who by location were forced to use the bottled product, it must be conceded that rural living in California, by virtue of her large oil fields, could be much "easier" than in most parts of the nation and the world.

#### Monopolies and Large Scale Land Use

The mention made in preceding paragraphs of the heavy gasoline taxes paid by one of California's oil companies gives some idea of its immense volume of business. In 1941 this company's assets





exceeded 600 million dollars. With 13,660 miles of improved State highway alone in 1941, California herself was an immense consumer of the gasoline and oil sold by such oil concerns as Standard, Union, Shell and Texaco. In 1941, automobile registration in the State covered 3,044,270 vehicles, the greatest of any state in the Union.

The Pacific Gas and Electric Company, serving three million people from Mt. Shasta to Tehachapi, with 12,000 employees, was a 700-million dollar corporation. The Southern California Edison Company, the parallel concern operating on the other side of the Tehachapi Divide, in 1941 had over 4,000 employees and a capital stock of over 156 million dollars.

California was more than ever the home of immense private enterprises dealing with actual use of the land, or directly with the products thereof. The great Safeway food corporation in 1939 had 1015 stores in California, 19,000 employees; 70 warehouses; 19 bakeries; besides creameries, vegetable, meat and fruit processing plants. This big food trust, monopoly, or private enterprise - whichever way one prefers to designate it - is credited that year with a gross business of \$385,882,000.

Also reflecting huge scale business enterprises, the California State Board of Equalization gives the total assessed valuation of California property, real and personal, for the Fiscal Year 1941, as \$7,938,061,404. That not all of this wealth was by any means centered in metropolitan areas, is indicated by the Board's figures of an assessed valuation outside of incorporated municipalities of \$2,689,775,668.

Rounded off figures by the same State authority for the fiscal year of 1941 gave the assessed valuation of gas and electric companies as 547 million; telephone and telegraph companies, 185 million; inter-county pipe lines, 22 million; refrigerator, Pullman and private railroad cars, 3 million; express companies, one million, and railroads, 267 million, a total public utilities assessment valuation of one billion and twenty-five million dollars.

The magazine FORTUNE in the concluding years of the 1930's, describing the magnitude of California's leading public utility and landowner, produced the following masterpiece of figures:

The Southern Pacific Company is one billion, nine hundred and fifty-nine million dollars. It is fifty-two companies and fifteen major investments. It is 8,900,000 acres of land, which is more than there is in Massachusetts and



Connecticut combined. It is 6,000 town lots and a patch of ground at Rockaway Beach, Long Island. It is oil, timber and coal. It is electric railways, warehouses, ferries and hotels; motor trucks, tractors and dollies. It is 82 motor buses and a 36 percent interest in the Pacific Greyhound lines. It is 80,000 employees. It is a pile of cash - \$27,000,000 high. It is a \$744,000,000 debt, a \$30,000,000 interest charge. It is - or was in 1936 - a \$14,000,000 annual tax disbursement, \$500,000 to the U.S., \$13,500,000 to the states and communities it serves. It is bigger than the General Motors, or Standard Oil of New Jersey, or U.S. Steel. It makes A. & P. (\$191,000,000 assets) look like a country grocery store and Woolworth (\$192,000,000 assets) like a ribbon counter. It is, in short, after A.T. & T. and the great Pennsylvania Railroad, the third largest industrial corporation in the land.

Besides big land holdings in other far Western states, the Southern Pacific still owned around two and three-quarter million acres of land in California and maintained land sales offices in more than twenty California Centers. While by far the greater part of these lands were desert or grazing land some very good agricultural areas were yet held by the corporation in Los Angeles, Imperial and Riverside counties.

Altho some of the Southern Pacific Lands were located as far north as Yuba county, around 75 percent were in San Bernardino, Riverside and Imperial counties where a large proportion of the holdings were frankly barren, waterless desert. Prices ranged from 50 cents per acre for desert lands to \$60.00 per acre for lands with good agricultural possibilities. Terms of purchase were quite fair. Non-agricultural lands were sold on a ten-year payment contract with ten percent of the purchase price down. Agricultural lands were sold on 19 and 24-year contracts with a required down payment of only seven and one-half percent of the purchase price and six percent interest on the deferred payments. In the case of farmlands, actual settlement and cultivation was required.

Even the strongest partisan of Government ownership of public utilities must concede that while building up Midas-like fortunes for their preferred stockholders, the big public utilities and large corporations rendered efficient public service, sold good products at reasonable prices and, with the exception of the land barons engaged in straight agricultural production, treated their employees fairly and paid them well. It must probably also be admitted that these great combines of capital built better structures at a lower cost than was common to government projects of a similar nature. The cold facts of California land use history





offer additional proof that private land colonization schemes were almost universally successful, - the one expensive State venture was decidedly the reverse.

In 1935, California had 37 percent of all owned farms in the United States producing an annual crop of \$39,000 or more each. In the State that year were found 30 percent of the cotton farms; 41 percent of the dairy farms; 44 percent of the general farms; 53 percent of the poultry farms, and 60 percent of the fruit farms of the nation operated on a large scale basis.

In his 1941 book, "America's Own Refugees," Henry Hill Collins, Jr. in describing the exploitation of labor on California farms, states - "The Golden State has the largest, the most intensively cultivated, the most modern, and the most highly 'agronomized' and mechanized farms in the country. California never had any appreciable group of small, independent farmers, but she has always had numbers of landless rural proletarians." The truth of this statement can hardly be challenged, yet such independent farmers as did exist were pretty well organized in combines or cooperatives, some of which were almost as powerful as the big public utilities themselves.

There were over 400 cooperative crop handling and marketing organizations in California in 1937. Some were local, some were State-wide. Altogether they included 37,000 individual members. Naming ten of the largest of these combinations of landusers would include the California Fruit Exchange, handling fifty percent of the State's fresh fruit; the Challenge Cream and Butter Association of Los Angeles, fifty percent of California's cream and butter; Poultry Producers of Central California, thirty percent of the volume of eggs; Sun Maid Raisin Growers Association, thirty percent of the raisins produced; Mutual Orange Distributors of Redlands, fifteen percent of the orange crop; California Turkey Growers Exchange, one-fourth of the turkeys; California Almond Growers Association, seventy percent of the almonds; California Walnut Growers Association, eighty percent of the walnuts; Prune and Apricot Growers Association, thirty-five percent of the prunes, apricots and pears, and the big California Fruit Growers Exchange which handled seventy-five percent of the oranges and ninety percent of the lemons produced in all of California.

The California Fruit Growers Exchange in 1941, as California's largest farmer cooperative, handled for its members some fifty-three million boxes of oranges and lemons, besides a huge volume of other fruits. Only an approximate five percent of California's citrus fruits are marketed by independent growers themselves.



One of the State's agencies whose work gave it an opportunity to appraise the true value of California farmer cooperatives was the Governor's Reemployment Commission which made a thorough State wide investigation of rural California. In its 1939 report it strongly recommended large-scale producer and consumer cooperatives as the best cure for California's economic ills and this report asserted that these cooperatives, while they should be State aided till able to pay their way, "must be operated 'consciously or unconsciously' unhampered by:

(1) Government red tape; (2) Other than trained and efficient personnel for supervision and direction and (3) The lack of a policy and program making for continuity and stability."

This eight-man commission, headed by J.R. Richards, was charged by Governor Culbert L. Olson with the responsibility of "analyzing the unemployment problem from every angle - economic, social and financial." The chief State executive, in his mandatory instructions dated March 4, 1939, also told this group, -

"Ten long years of depression have seen unemployment in California unabated. We now face unemployment as a permanent problem. We seek its permanent solution. No longer can we afford the extravagance of emergency measures, necessary as they have been in the past. We cannot continue to spend public monies to keep the unemployed on a dole which merely provides a sub-standard level of bare existence."

This commission did a thorough job of investigation and did not mince words in its report and recommendations. Its members pointed out that even in that year of 1939 there were yet twenty-one Federal agencies, spending hundreds of millions of dollars annually, related in a big or small way to relief and rural unemployment problems, besides twenty-five State agencies working along the same lines.

They reported that while the selling cost of consumable goods in private industry averaged about 35 percent of the price paid by purchasers for the finished product, some California agricultural products were sold to the California consumer at 300 percent more than the price paid to the farmer. They called attention to the fact that over two million acres of rural land and 40,000 acres in subdivided urban lots were held by the State under tax deeds, stating, "Any system responsible for such high (tax) delinquencies is either economically or financially unsound and needs revision."

This fact-finding body industriously dug into all forms of land use. They reviewed the large farm unit ownership, reminding the State government of the fact that one-ninth of the farms in



California possessed more than four-fifths of the State's farm acreage. One of their recommendations was that the State planning Board be reorganized on a more practical basis and another that this reorganized planning board undertake a thorough study of the ownership of farm land and the operation of agricultural enterprise. They pointed out the value of the Central Valley Water Project, its promise of new farm lands and the resultant betterment of lands already under cultivation. Gathering war clouds postponed action on their very creditable work, but California in a post-war world will be greatly the gainer if their recommendations for intelligent land use are considered when peace comes again.

### Government Agencies and Their Work

Through their social and semi-social cooperatives such as the Grange, Farm Bureau, and Farmers Union, California farmers in the 1930's took more than an ordinary interest in politics and government administration. These Farmer organizations expressed concern over expanding government agencies and mounting government expenditures even though they themselves were the recipients of liberal bounties drawn from the public purse in the form of subsidies designed to prop the staggering prices of their farm products. Their chief complaint seemed to be merely against a trend towards regimentation of agriculture and overlapping of functions of different governmental agencies.

This factor of the extent of overlapping functions of different departments and bureaus of the Federal government is often exaggerated in the public mind and sometimes more fancied than real. Due, in part, perhaps, to the fact that for every Federal agency dealing with land use, there is a corresponding State agency, the two are often lumped together in the mind of the taxpayer. As an illustration, one might cite the Federal Forest Service and Park Service, the State Division of Forestry and the State Division of Parks, the functions of which are often mixed in the public thinking.

Altho both agencies deal with the administration of wild mountain lands, there is little parallel between the Federal Forest Service and the Park Service. As has been previously pointed out, the latter is concerned with preserving things as they are in their particular domain. The administration of the former involves utilization to the limit of the lands under their charge, consistent with the same or better use being made thereof in the future.

There is no duplication of effort in the work of the State Division of Forestry and the United States Forest Service, both of which agencies handle fire control on wild lands. The State





agency takes care of fire control on valley lands and the low-lying foothill areas, the Federal agency on the intermingled public and private higher-lying mountain lands. The State Division of Parks has no title in or jurisdiction over the national parks, neither has the Federal Park Service over the State park system. All four of these State and Federal agencies, however, work in close cooperation with one another and borrow or exchange each other's ideas and systems for the betterment of the lands they are guarding or administering.

The growing complexity of land use problems, land misuse, overproduction of certain crops, improper farming methods, worn-out lands, soil erosion, fire and flood, called for expanding public service, service not needed when the soil was new and there were always virgin lands to be had for the taking. As in a previous chapter, again a simile could be drawn of a city of half a million inhabitants which could not exist if it depended for fire protection on a few volunteers and the hand hose cart used in the days when it was a village of 500 people.

Lack of space forbids any lengthy listing here of government agencies and their functions concerned with California rural land use in recent years or of the laws which brought them into being. Some have served their purpose and have been disbanded; the need for others increased as time went on. Furthermore, it might be said that any large institution cannot be created and start functioning or be disbanded over night, therefore, there must needs be some overlapping of functions during the transitory period.

The Agricultural Adjustment Administration, first established in 1933, was the parent of several other land use agencies created under various laws passed during the 1933-1941 period. The primary purpose of the AAA, or Triple A, as it is often called, was to insure parity prices to the farmers for their products, based on the average purchasing power of things the land user produced as applied to the purchase of the things which he needed. The period on which the average parity price was based was the year 1909 to 1914.

The farmers of the Agricultural Adjustment Act which brought the AAA into being recognized that a healthy condition of agriculture and industry was interdependent and the basic idea was to do away with the disparity between the income of the average urban resident and that of the rural land user. In 1932, there was a disparity between the two classes of about 34 percent, in favor of the urban dweller. By 1935, through the workings of the Act, the differential had been reduced to approximately ten percent.



The AAA involved subsidy payments to farmers to offset the effects of drouth and crop failure, or over production. From the passage of enabling legislation in 1933 up to December 31, 1935, 42,990 head of cattle and sheep were purchased in California by the agency for a price of \$352,127, a very much lighter subsidy than paid to other agricultural states. The livestock, as well as other farm products purchased, wherever possible, were turned over to the Federal Surplus Commodities Corporation for distribution to families on relief rolls; in other words, it was removed from an overloaded market entirely.

One of the functions of the AAA was to make allotments of acreages of various crops to be produced by different states to make up the national total production, paying the farmers for losses due to curtailment of crop acreage. In 1934, 130,600 acres and in 1935, 109,800 acres, mainly cotton and wheat, were shifted by the workings of the Triple A to other crops in California. Again this was an infinitesimal part of the shifted crop area of the nation's 35 million acres in 1934, and 30 million acres in 1935.

Altho participating both in price adjustment and crop area control, one of the main functions of the Triple A in California was the direction of the agricultural and range land conservation program, a concise definition of which was "compensation to farmers for doing things in the national interest which the farmer would be unable or less able to do alone." This program of the AAA was actively participated in by the U.S. Soil Conservation Service, the Agricultural Extension Service and the U.S. Forest Service, all agencies dealing with intelligent land use management. All AAA work plans, however, were handled through local committees of farmers, working in turn through a State committee.

The general aims of this overall land use agency was succinctly stated in its California program as follows: (1) To promote the conservation of land, our most important natural resource. (2) To produce a sufficient abundance of agricultural commodities for domestic and import needs, but to avoid accumulations of price-depressing surpluses. (3) To provide that agriculture shall receive its fair share of the national income.

The total net payments for the AAA program in California in 1939 was \$8,254,220 for farm programs and \$221,092 for range conservation. The cost of administration of the work was \$695,359, making a total cost to the Federal purse of \$9,170,671. Among the leading agricultural counties, Tulare received \$1,264,377, and Fresno, \$1,043,469. Los Angeles, richest agricultural county in the nation, was paid only \$170,265.





No subsidy payment was made without the approval of both the working agency and the local farmers' committee. That both the Federal agencies and the farmers' committee did a painstaking job in their surveys and investigations, is illustrated by the fact that as against the total AAA subsidy payments of slightly less than eight and one-half million dollars, over twenty million dollars was actually available for California, plus the cost of administration. The total acreage participating in the range conservation program in California in 1939 was 6,035,000. The 1219 ranching units involved received subsidies of \$221,092, or an approximate average of \$181 per unit.

As part of the Triple A program, the Federal government went into the insurance business in 1938 with the creation of the Federal Crop Insurance Corporation. Crop insurance, first applied only to wheat, was later extended during war years to cover cotton crops also. In this program there was no subsidy involved and the crop insurance policies were passed upon by the local Triple A Committees.

The Reconstruction Finance Corporation, created in January, 1932, even though its main purpose was to bolster tottering financial institutions, was originally responsible for financing a lot of California rural land activities. So far as agriculture was concerned, this agency was absorbed in the Farm Credit Administration in 1933. Nationally, 96 percent of the almost 326 million dollars loaned to farmers by this credit agency was repaid by the end of 1938. Altho there was an element of farm relief included, the main function of the Farm Credit Administration was making loans to farmers on a strictly business basis, but on easy terms and at low interest rates.

The alarming loss of topsoil throughout the nation, in some locations involving utter depopulation of formerly thriving communities, was responsible for legislation creating the Soil Erosion Service in 1933 - two years later designated as the Soil Conservation Service. Its functions were the rehabilitation of land through control of soil erosion, purchase of submarginal farm lands and flood control in cooperation with the U.S. Army Engineers and the U.S. Forest Service. It furnished technical help to farmers to aid them in practicing conservation farming on their own lands, generally selecting some farm in a community as a demonstration area.

The first step in the program of this new Federal bureau, which worked hand in hand with the Bureau of Agricultural Economics, an older farm assistance agency, was to organize soil conservation districts by a majority vote of the farmers in a given locality



which agreed to till their lands under conservation methods outlined by the Bureau's technicians. The second step was an inventory of the individual farmer's land by the agency's experts, and based on this detailed survey, the farmer was advised on the methods of cultivation best adapted to prevent loss of the precious topsoil, or to rehabilitate as much as possible lands already damaged by soil erosion.

California lands, altho not suffering the excessive soil erosion prevalent in some of the other states, nevertheless had plenty of this type of problem, to which the gashes in the soil of hillside farms gave mute testimony. There was no lack of this visual evidence. To rural land users, watching their fertile topsoil swirling down the ever-increasing number of vegetative cover on a hillside was an open book which even the most ignorant might read.

A few trees such as even the rather despised digger pines on a slope with their mat of needles underneath, made all the difference in the world. It could be noted that even a lone tree on a bare hillside resulted in a patch of unbroken ground supporting a stand of grass, while all around it the soil was cut up into countless gashes, each contributing its quota of topsoil to the nearest larger winter torrent.

In the control of this gully erosion, rough dams or checks were built of rocks, brush or debris of any kind. The silt carried down the gullies by the winter rains settled around these obstructions and in time the gully levelled to the contour of the surrounding land. A further step was contour, or terraced plowing, whereby cultivation followed the contours of the land rather than going straight up and down the hill, liberal furrows being left parallel with the slope to catch soil which had a tendency to wash downward. It might almost be said that the straight furrows which were the old plowman's pride were gone forever in some parts of California.

Among the rich orchard lands, the puddle method under which shallow basins were scooped at intervals, was widely used, the rain water gathering in these depressions rather than washing over the land. At times soil erosion control work on farmlands and pastures involved tree or shrub planting in the larger gully bottoms, and sometimes the planting of soil-binding vegetation over considerable areas. Encouraged by their local farm advisors, California farmers subscribed quite readily to the new gospel of soil conservation and by the end of 1941 there were thirteen organized districts in the State, embracing an area of farm and pasture lands of 773,000 acres.



The program of the Soil Conservation Service and kindred agencies concerned with better land use practices was greatly aided by progressive farmers themselves who often set the example for their less interested or less progressive neighbors. One outstanding farmer-conservationist in the southern part of the State was Ted Chamberlin, proprietor of an 8,000-acre cattle ranch in Santa Barbara county, and for a considerable period president of the California Cattlemen's Association. Land use practices on the Chamberlin Ranch, often involving long range planning, attracted wide attention.

Chamberlin's broad acres were suffering from gully erosion; crooked creeks meandering thru his lands washed out fences and allowed cattle to escape; losses from cattle mired down in mud holes cut into production profits, and silted acres afforded scant pasturage. Using equipment on hand, the nearest available materials and the spare hours of his ranch hands, the young man embarked on a soil conservation program of his own, without benefit of Government subsidy. Building dams and catch basins, installing culverts, diverting the flow of water in crooked creeks into straight ditches, much of the gullied lands were soon restored.

One wide gully was over 500 yards long, ten to twenty feet deep, and a constant menace to winter traffic on a national highway traversing Chamberlin's property. Inducement for the silt to settle and build up new land was given by constructing checks in the menacing gully with discarded autos, old tin cans, brush and debris, supplemented by some carefully planned concrete work. In a matter of three or four years the big gully, often jocularly referred to by local residents as Tin Can Gulch, was level and over the newly built up land was wavering a luxuriant crop of Sudan grass.

As one of his other conservation moves, Chamberlin pulled a heavy iron drag behind a tractor over flat lands on which dense brush cover had choked out the grass growth. A seeding attachment sowed the land with grass seed, resulting in its conversion from non-usable land to first rate pasturage.

The Commodity Credit Corporation, empowered to buy, sell, grant loans upon, or otherwise deal in agricultural commodities with a view of stabilizing farm prices and providing for orderly marketing of farm products, was established by Executive Order of October 16, 1933. The Bureau of Entomology and Plant Quarantine, directing nationally the control of insects, pests and diseases of plant and tree growth, including importation from foreign lands, was streamlined from the old Bureau of Entomology in March 1934.

The Agricultural Marketing Service, which was established by the Secretary of Agriculture July 7, 1939, collected and compiled





agricultural statistics and disseminated information on available supplies, prices of and demands for various farm products.

The Bankhead-Jones Tenant Act of 1937, the basic purpose of which was to assist qualified farm tenants to become landowners, was responsible for the creation of the previously mentioned Farm Security Administration, a Federal Agency, the activities of which greatly broadened during the ensuing four or five years. This agency not only concerned itself with handling low-priced, long term loans to farm tenants changing over into landowners, but exercised its efforts in general farm labor rehabilitation, farmers cooperatives and farm community betterment.

One of the publications of this agency states: "The business of the Farm Security Administration is the business of rehabilitating families," referring, of course, to farm families. Since this field was a broad one in California as elsewhere in the nation, the belief of some farmer groups that the work of this agency did to some extent duplicate that of other Federal and State agencies was quite pardonable. There can be little question, however, but that the FSA did good work for what might be termed the "down and out" rural land users.

In California, there was projected or completed by the FSA up to September, 1941, eighteen labor camps for migrant farm workers, with a capacity for approximately 4,300 families. Such of these migrant workers' camps as had been improved by that time had as a minimum, at least, free trailer parking space or wooden tent platforms, fuel, sanitation and water facilities. Some few had plain, one-room family shelters. Besides these camps, in connection with its transient farm labor rehabilitation program, the FSA had established or were in the process of establishing, nearly 550 laborer homes. For the purpose of stabilizing farm labor, these simple homes, located in the richer agricultural areas where work was fairly constant, included a small plot of ground on which the worker and his family could raise a garden. The rental charge for one of these farm labor homes was \$8.20 per month, the rental price including contingent utilities.

Up to June 30, 1941, the Farm Security Administration had made a total of 6,556 rural rehabilitation loans in California. Almost half of this number were negotiated in the first year of the agency's existence, an indicator, undoubtedly, of bettering rural conditions. Of this 6,556 farm borrowers, 58 percent were full or part farm owners, 14 percent were purchase contract holders and 28 percent out and out tenant farmers. Of the borrowing tenant farmers, seven percent held leases on their land for one year, 91 percent for from two to five years, and two percent for six years or more.



That farmers appreciated the work of the versatile local county farm advisor and felt that some of the newer agricultural agencies were usurping the place occupied by the firmly entrenched Agricultural Extension Service is evidenced by the statement of Edward A. O'Neal, president of the powerful American Farm Bureau Federation, who in 1939 publicly said: "It (the American Farm Bureau) wants agriculture under one roof. The Farm Bureau wants county agents to captain the whole show. It wants all agricultural programs to work outward from the local Farm Bureau offices to farmers. I believe in the old notion of the Extension Service as a vehicle for carrying the job to be done to the farmer, leaving policy making to a voluntary membership as a foundation."

The members of the American Farm Bureau made little concealment of the fact that their principal goal was to shape national policies affecting agriculture. The trend of farmers' thoughts and their interest in national policies and economics was expressed by resolutions passed at the 21st annual meeting of the American Farm Bureau held in Chicago December 3 to 7, 1939. These resolutions ran the whole national gamut from Philippine independence, health, labor and education, to national farm credits and national forestry. That the organization was alive to all forms of inter-related rural land use was shown by one of their most emphatic resolutions in which the convention asserted that they were "uncomprisingly" opposed to the transfer of the national forests from the jurisdiction of the Department of Agriculture, an administrative move again being urged by some interests at that time.

### Conservation and Land Use Planning

Conservation was taking the place of pioneering; no more new lands, but in place thereof better use practices applied to the lands already under the plow or being operated by the minor and lumberman. "Conservation" became a keyword in the American vocabulary, particularly in California where exploitation for immediate profit had so often been the prime motive in land use.

It is somewhat interesting to note that the word "conservation" was defined by two government land use experts (not foresters) in the 1940 edition of the Department of Agriculture Yearbook in almost the identical words used by Gifford Pinchot, Chief United States Forester, almost forty years previously. Applying the word generally to intelligent use of soil, timber and minerals these officials defined it thus:

"Conservation does not necessarily mean using less today. It does mean wasting less. It is a matter of good husbandry, or good management practices. Good conservation practices frequently are





no more costly to apply than destructive ones; sometimes they cost less . . . Conservation in a democracy means wise use of resources for the greatest good of the greatest number in the long run. This objective means that conservation must be concerned with more than the physical condition of the resources themselves. It means regulating the management of resources to the welfare and betterment of the people as a whole."

In 1933, upon President Roosevelt's appointment of a Planning Board to deal with land use problems on a national basis, the State of California followed suit. Its original members, drawn mainly from the ranks of leading public officials, changed from year to year, but its stated purposes remained the same. These included better urban planning, substitution of timber-producing and watershed forests for submarginal farmlands, better use and wider distribution of water, conservation of oils and other minerals, wild life, hydro-electric development and preservation of historic values, esthetic landmarks and scenic resources.

At the start the State Planning Board had no appropriation and struggled along in its work by chiselling assistance from WPA and other existing State and Federal agencies. In 1935 it was recognized as an official State body by act of legislature and in 1937 was allocated funds to enable it to carry on under its own power. In their report to the Governor, Samuel C. May, Chairman, and J. Deming Tilton, administrative officer, pointed out that the State Planning Board had by 1939 fifteen hundred lay citizens and officials serving on local planning boards throughout the State.

California had the first county planning commission in the United States and by 1939 had such commissions in 33 counties, plus 132 city planning commissions. While one of the Board's State-wide projects dealt with plans for delinquent tax lands, by that time they had become concerned mainly with urban and semi-urban projects such as zoning and housing, preservation of historic, scenic and recreational values, and public works such as highway locations.

In their study of delinquent tax lands, the State Planning Board cited the fact that in 1937 California had 3,567,000 acres of such, all except some 36,000 acres being rural lands. This represented approximately three and one-half percent of the State's total land area and around eight percent of all lands held in private ownership. The assessed valuation of California tax delinquent lands increased from 30 million dollars in 1928 to over 56 million dollars in 1930, to more than 112 million dollars in 1933, and on up in later years.

Undoubtedly, the publicizing of these figures had something to do with legislation in June 1940 which greatly simplified acquisition



by the State of tax delinquent lands. This streamlined law terminated the right of an owner to redeem land tax delinquent for five consecutive years after it had once been deeded to the State, replacing the former cumbersome, drawnout procedure formerly necessary for the return of idle, non-paying lands for public proprietorship.

Representing a somewhat different type of planning from that of the State Planning Board and getting closer to the soil itself, was the Natural Resources Board. This Federal agency was created by Executive Order in 1934, with the Secretary of the Interior as Chairman, the Secretary of Agriculture and other high-ranking government officials being included in its membership. Their first report back to the President, submitted December 1, 1934, recommended a "Continuous National Planning Agency."

The reports on national land use planning, made in the years following, were participated in by various land use agencies of both the Department of the Interior and the Department of Agriculture. These complete, detailed, voluminous reports covered every section of the nation and so far as California was concerned included recommended purchase by the government of private non-producing pine timberlands, purchase and public administration of redwood timber units, acquisition of woodland areas, recreation areas, and particularly of submarginal farm lands.

National, State, county and community land use planning had become an actual necessity. It was a complex undertaking, including as it did the elements of soil, water, climate and the well being of the land users themselves. Towards the end of the 1930-40 decade, land use planning committees were functioning in nearly all rural sections of California. Usually, the county farm advisor acted as the clearing agent for the work, participated in also by the Soil Conservation Service, Bureau of Agricultural Economics, Forest Service, Bureau of Reclamation, Agricultural Adjustment Administration, Farm Security Administration and other Federal, State and county agencies dealing with land use. In making surveys and plans, recourse was again had to local farmers' committees, often the same public spirited land users serving on these bodies as were functioning on local boards in connection with the Triple A. program.

No factors in any way influencing rural land use were overlooked by these rural planning boards. They covered the whole field of soil, climate and rainfall; of available water, potential water development, quality of water and irrigation methods; of vegetative cover on wild lands, game management, relation of forest and farm and soil erosion problems; of pest and weed control, fertilizing and proper cultivation methods, of markets, ownership, tenantry, rural living conditions, existing and potential public utilities; recreation, schools and roads.





A national summary of the data gathered by these rural committees disclosed that it required 1.9 acres of crops per person to feed the people of the United States for the period 1924 to 1934. Non-food products required 0.2 per acre per person, with an additional 0.4 acres to feed livestock used in producing farm crops, making a total average area of land required of two and one-half acres per person to maintain Americans in the American way. With her long growing season and her intensive farming methods, California could greatly exceed the national average acreage production, and the wide range of her producing capacity stood out boldly in the national figures.

The United States Department of Agriculture in 1939 stated that there were 500 different types of farming in California. Some of these, however, were small scale operations. The local Agricultural Extension Service listed almost 200 different farm crops produced commercially in sufficient volume to contribute materially to the State's aggregate agricultural income. In 1934, much of California's irrigable land for which water was available was not being cultivated and the State's production capacity, therefore, was far from being reached.

The planners at the nation's capital were perhaps a trifle over-optimistic in their report of that year, however, when they stated that the ultimate irrigable area in California was 16,673,000 acres. Their figure included 9,857,750 acres potentially irrigable, but for which no water systems existed and they estimated that to develop adequate water and get it to the edge of the lands themselves would cost around \$50 an acre for 1,031,079 acres, and an unknown amount (estimated as high as \$100 per acre) for the remaining 8,226,671 potentially irrigable acres. Their figures on the cost of development of irrigation water did not include the cost of preparing the potential agricultural lands themselves for irrigated farming operations.

The local community planning boards had no conclusions about the present and potential producing capacity of the lands with which they were intimately acquainted, nor the value such lands had attained thru the process of years of their development. The slender chances a competent young tenant farmer or farm laborer had of becoming an independent landowner was a problem which gave these local planners considerable concern, and one finds these farmer boards almost unanimously in favor of long term loans by the Federal government at easy interest rates. The investigative work of these committees in San Luis Obispo and Santa Barbara counties is quite illustrative of the wealthier agricultural counties of the State as a whole, since they included within their boundaries a wide range of California terrain and a wide diversity of land use.





The area of the two counties was 3,885,440 acres, of which slightly over half a million acres was crop land, the balance being urban development and wild lands. Their annual vegetable production ran around three million dollars, an exclusive Japanese venture and with no apparent chance for a young white man without unlimited capital to engage in that particular type of farming.

In the realm of citrus fruit production, mainly lemons, to produce a good, comfortable family living, twenty acres was required. A going concern of this nature would cost around \$25,000 minimum, and it was recorded by the planners that to engage in this type of farming a young man must have a cash capital of at least \$10,000. Some families were doing quite well on a ten-acre lemon farm, however, with nine acres devoted to the basic fruit crop and one acre to chickens and a farm garden, to supplement the income from fruit. Walnuts, another staple crop of this section, presented the same relative farm problem of high-priced land and a 20-acre grove needed to insure a good family living; again \$10,000 cash was needed for a successful start.

Dairying was a leading agricultural venture in the two counties. To insure success in this line of endeavor, 160 acres was needed, including 20 acres of cultivated bottom land and the balance good upland pasture. With 20 milch cows and dairying equipment, the cost of such a place ran around \$24,000 and again a minimum cash capital of \$10,000 was needed.

Range lands were comparatively cheap, but in beef production the committees figured that at least 2,000 acres of land was required, 100 acres of fair dry farming land for hay production and the balance fairly good grazing lands. With a herd of 150 to 200 cattle, an agricultural plant of this nature would represent an investment also of \$25,000, or more, and in this line also the inevitable cash capital of \$10,000 was needed to make any kind of a safe start.

Bean production under dry farming methods seemed to offer the best opportunity for the farmer with limited capital. Here again it was found that the farmer should have 150 acres of mesa land to produce a paying crop and this would cost anywhere from \$50 to \$100 per acre for the bare land. A comfortable home, domestic water development and necessary farming equipment ran the cost of a farm of this nature well up towards \$20,000. One-crop farming of a staple crop such as this was always a risky business, too, its successful prosecution dependent upon stable markets and no crop failures.

When wartime demands caused temporary suspension of the work of these farmer land use planning committees, complete, detailed plans had been drawn up covering thirteen counties of the State, ranging from Lassen county in the north to Orange county in the south, with the work in other leading agricultural counties well under way.



W. R. Ralston of the Agricultural Extension Service, who actively headed up the work on a State-wide basis, stated that in the final complete plans for agricultural use the four leading factors considered were; first, Water; second, Soil Fertility; third, size of Farm Units; and fourth, Plant and Soil pests.

### Illustrative Cases of Land Use

While exceptions did not occur frequently enough to prove the rule, sometimes men with very limited capital, by dint of hard work and good management had made a success in California land use in comparatively recent years. One such case which might be cited is that of Raymond Anchordoguy, a sheepman of Red Bluff, Tehama county.

Just before Christmas of 1906, Raymond Anchordoguy arrived in northern California from the French Pyrenees, almost penniless and with his entire worldly possessions in the portmanteau he had brought from overseas. The 21-year old Basque lad had completed the military service demanded by the French Republic and with visions of future financial success in Golden California had promised his brown-eyed sweetheart, yet in her early teens, that he would send for her when such success crowned his efforts. The girl promised simply, "I'll be grown up and waiting for you."

Young Anchordoguy plunged into the only business he knew, that of sheep husbandry, braving the cold Nevada winds month after month as a hired shepherd. The California stockman by whom he was employed noted that there were few losses in this young herder's band of sheep, which produced more and a better lamb crop than other bands ranged in the same general area. In less than two years he made it possible for the young sheepman to purchase on working terms a band of sheep of his own. These he tended to so diligently that a few years more saw him their permanent owner. Back to the girl in the Pyrenees went the word that now she also could come to this great country. The girl herself meanwhile had studied hard at leading schools in her province to secure the higher education denied her fiancée, and later was to handle the bulk of her husband's paper work as a full-fledged partner in the business.

Bankers in the range country where the individual stockman himself was sometimes the best security for a loan, advanced funds in 1916 for Anchordoguy to purchase the land holdings and some 7,000 head of grown sheep belonging to a retiring sheepman. The deal included renewable leases to some 85,000 acres of summer range in Modoc county and a considerable acreage of winter range in the Sacramento Valley area. In going into this deal, the young sheepman shouldered a tremendous burden of debt and sometimes things were not always smooth sailing. His own word as sacred as his pledged bond, Anchordoguy looked for the same honesty in others, with the result





that he was victimized on occasion by unscrupulous land sharks. In spite of this, and stock losses resulting from the regular hazards of the business, he promptly met interest and amortization payment on his loans.

A summer grazing permittee on the national forest only by virtue of his control of large areas of private land, he even exceeded good range management practices recommended by the local forest rangers. He practiced rotation grazing when such was a new range land use; hauled water by truck to secure the utilization of feed on waterless areas, and consistently held down numbers of stock to avoid overgrazing of his range lands. His herders were forbidden to "dog" away from his watering places cattle drifting in from adjoining ranges, and his cowman neighbors seemed to forget their natural antipathy toward all sheep and sheepmen in his particular case. Deer hunters were allowed to both camp and hunt on his lands and for years many hundreds of deer drank unmolested from his portable water troughs although hauling water over long miles of rough range was a costly undertaking. The latchstrings at his outlying ranches and camps were open to all comers.

When railroads first invaded his timberland range, he was the first to ship the animals to their range and the lambs from range to market by rail, avoiding the slow, cross-country traveling method generally followed by other sheepmen. His lambs, dropped in February, were ready for the early midsummer market and averaged around 90 pounds per head, against the general average of 85 pounds. The lamb percentage of his herds ran 115 to 118, as compared with the general run of 105. Although the general average of wool production was 7 to 8 pounds, Anchordoguy's sheep consistently clipped  $8\frac{1}{2}$  to  $9\frac{1}{2}$  pounds per head every year. While the average sheep raiser shipped his lambs to the Denver, Omaha or Chicago markets on consignment, Anchordoguy made the trip with his lamb crop in person, gaining considerable profit thereby.

Besides his urban family home and his flocks of sheep, in 1924 Raymond Anchordoguy, the French Basque emigrant boy of 1906, was the owner of a system of springs and developed watering places controlling a large area of summer mountain range, over 5,000 acres in Sacramento Valley foothill ranches and was the preferred lessee of many thousand acres of summer and winter sheep pasturage. Although two of his three children were with the armed forces, he and the remaining son managed to plant 1500 acres of grain as a further help towards the war production effort. Altogether the Anchordoguys were an outstanding American family, good users and ardent lovers of the new land of California.



Love of the land and intelligent land use on a much smaller scale was represented by the case of Sherman Weaver, a "little lander" living on the outskirts of Porterville, in Tulare county. Weaver's family background was American from pre-Revolutionary days. Moving from a Mid-West farming section in the second decade of the century, he worked as a farm laborer at such jobs as he could secure in California and managed to save a few hundred dollars. In 1923, he purchased an acre of land near Porterville and domiciled his family thereon. The small house on the property was entirely inadequate to house his family of a wife and four small boys, but as finances permitted, he purchased building materials and during slack work periods built a comfortable, enlarged house, meanwhile gradually building up a flock of chickens on his tiny farm. A milch cow was out of question so the little lander solved the problem of milk for his growing boys by the purchase of a couple of milch goats.

It was years before Weaver gained the independence he sought, since his financing had to be done step by step. Finally came the time when he could work exclusively for himself on his own land, mainly the taking care of a flock of purebred chickens and operating a small hatchery. By 1940 he was able to purchase an additional acre of adjoining land and his entire holding was free of debt. All the work on the place was performed by himself and his wife, including the carpentry and plumbing needed in building up the miniature farm. With a ready market for the products at their own door, he and his wife sold over 25,000 baby chicks a year at 16 cents each besides doing custom hatching; goat's milk and butter made therefrom; fertilizer to neighboring citrus growers; eggs, grown chickens and even cut flowers.

The gross revenue from the two-acre place, all added together, brought in more than \$8,000 a year. Weaver would have none other than purebred stock on his place, whether goats or chickens, and paid fancy prices to breeders for thoroughbred animals. The nearness of public utilities made possible many labor-saving devices and an urban standard of family living as well.

The coming of war found two of Weaver's sons in the armed forces, the other two in war work. The parents, working long hours, were carrying on in the production line on their semi-urban farm. Weaver's land, equipment and stock was easily worth \$10,000, the inventory including 9 milch goats, 12 younger goats, 600 breeding chickens, almost 500 turkeys and even a couple dozen rabbits. The comfortable home was surrounded by shade and fruit trees and a considerable vegetable garden was adding its quota to national production and the family income. Closely adjacent to the Weaver





property were several places containing basically the same land but which supported only unkempt grass and scraggly trees and shubbery. On such places it was usually found that the proprietor had been working on relief projects while Weaver was industriously digging in his own soil and winning for his family an independent existence on a small fragment of California land.

A somewhat different "little lander" type of land use was that practiced not far from Red Bluff by an Oklahoma Dust Bowl refugee in the late thirties. Watching the meager store of cash he had saved from the wreckage of his Dust Bowl farm home dwindle day by day, there seemed to this man no recourse but to go on public relief, a move repugnant to his independent American nature. He had noticed the perennial shortage of boards on surrounding ranches while all around were thousands of Digger pine trees which he found out could be purchased for a song.

"Digger pine lumber !" the local residents scoffed, "whoever heard of the like?" Digger pine might be alright for a certain amount of watershed protection and as a scant shade for livestock, they opined, but nobody had ever used it for lumber.

The Oklahoman, being of a mechanical turn of mind, picked up a cheap, secondhand engine and some scrap here and there and built a small sawmill. It wasn't much of a sawmill and the boards which he processed from the Digger pine trees were a decidedly poor grade of lumber. Nevertheless neighboring ranchers found scores of uses for these rough boards and the enterprising, modern California emigrant was able to sell all the lumber he could manufacture with his homemade sawmill at \$17 to \$20 a thousand board feet. One family less appeared on California's relief rolls.

Most of the old Mexican cattle ranches had been divided and subdivided again and again. Two of the few which retained their approximate original identity and boundaries were the Rancho Las Mariposa, located in the foothills of Mariposa county and the Rancho Santa Margarita Y Las Flores, lying mainly in San Diego and Orange counties. These two areas of old Mexican grant lands present a striking illustration of good and bad land use practices.

Rancho Las Mariposa embraced 44,386 acres of land included in one of the first Mexican land grants to which titles were confirmed by the famous Land Commission of the fifties.

The original patent to this rancho was awarded to none other than General John Charles Fremont. Through the years of changing ownership since, the land had been badly abused. Originally good pasturage, the land was used so heavily for such purpose that overgrazing had resulted in the native succulent forage being





replaced by worthless annual grasses and weeds, growing among a heavy cover of chamise, manzanita and other low value shrubs.

Fire in past years had ravaged the area time and again, followed in each case by excessive sheet and gulley erosion of the topsoil. The entire grant had received virtually the treatment of the no-man's land of the unreserved public domain. At the time the original grant was made, the area would support around four or five thousand head of cattle the year around, providing a comfortable living for a dozen or more families. Now, the entire area of the old land grant provided but sorry range for some 500 head of cattle part of the year only.

The famous Santa Margarita Rancho represented just the opposite extreme to that of Las Mariposa. Part of it originally belonged to the Franciscan Missions and a larger section of the area to Pio Pico, last of the Mexican governors. About the time of the American conquest of California, the lands were consolidated to form a huge rancho unit of 250,000 acres which in 1864 was transferred to John Forster, who had married one of the Pico sisters. On John Forster's death in 1882, the title to the property passed to James Flood and Richard O'Neill, the consideration mentioned being \$450,000. O'Neill lived his life out on the property which remained in the hands of the family heirs, operating as a corporation, until 1937. That year it was sold to R. A. Rowan and Company, Los Angeles realtors, this time the selling price being three million dollars.

For over a century, not only did all the glamour, romance and big scale hospitality of the early California days mark the operation of this big rancho, but it was also an outstanding example of intelligent land use as well. The owners were satisfied with fair returns and year after year resisted all the efforts of population pressure to make their vast land empire the basis of profitable real estate subdivision developments. Instead of big real estate profits and overuse, the history of this largest active ranch in California is thru the years a story of easy, pleasant living on the part of landlord, tenant farmer and employee.

The Santa Margarita Rancho is made up of a widely differing terrain, including sea coast, mountain areas and fertile valley lands. While the main activity engaged in by the ranch corporation itself was cattle raising and grain production, a wide variety of crops were produced. We find the old inventory of 1835 mentioning "16,000 vines in fructifying estate, fruit trees of divers species, and 2,500 varas of wall fence." In the same lengthy inventory of existing improvements, Pio Pico, the proprietor at that time, placed a valuation on the entire rancho, exclusive of livestock,



of "Nine thousand, eight hundred and Sixty-seven Dollars and Four Bits." Ten years later an inventory credited the rancho with the ownership of 10,000 cattle, 2,000 horses and 15,000 sheep.

In 1857, the assessed valuation of the ranch lands was given at only \$1,820, but seven years later this figure had increased to \$16,640. In 1927, the 132,000 acres lying in San Diego county was alone assessed at \$1,270,000. In 1878, the rancho books record one sale by John Forster of 4,000 head of cattle at \$18 per head. These cattle were pastured on the wild lands and during the seventies grizzly bears roamed the broad acres, one such killed during that period being recorded as weighing over 1,400 pounds.

Evidently in connection with some refinancing of ranching operations, the San Diego Union of February 8, 1881 records the transfer of 134,000 acres of the rancho in San Diego county from John Forster to Charles Crocker of San Francisco. With 9,000 acres of Las Deschasi Rancho in Los Angeles county thrown in, the total consideration is given as \$207,000.

Through the years, a force of around 500 men were employed year-long in the operation of the rancho proper, but some of the intensive farming operations were carried on by half a hundred permanent tenant farmers, ranging from grain producers and dairymen operating as much as 1,000 acres in a single unit, down to little-landers producing vegetables, honey and poultry. There were always at least 250 families on the rancho lands, descendants mainly of retainers of the old Mexican days. It is recorded that the tenant farmers consistently made more money from their lands, proportionately, than did the rancho owners themselves.

As in nearly all California agricultural land use, water was the main concern in later years of the Santa Margarita's proprietors. In 1926 they engaged in a suit to establish their riparian water rights to the Santa Margarita River against the Vail Company, owners of extensive adjacent ranch lands. This was the largest water suit ever witnessed in California courts. It dragged through three years of litigation and during the 44 days that the case was heard, 195 witnesses testified. Topographic maps costing \$50,000 were introduced as evidence and some 2,200 exhibits filed. Judge Lacy D. Jennings, who decided in favor of the Santa Margarita Rancho interests and awarded them 76 percent of the water, estimated the entire cost of the case at one million dollars.

In the face of costly water troubles and tempting offers by realtors to the owners to break up their big land holdings, the vast





land unit was administered on a conservative land use basis. Organized patrol was maintained to guard against brush and grass fires, pasturage of range lands regulated to prevent overgrazing and intelligent farming methods practiced, this on the biggest ranch in a State noted for its large ranch holdings. There was no "mining" of the land for immediate profits. The entire area was enclosed by a stout fence, in the year 1933 alone, 27 miles of main roadway being fenced to prevent large numbers of cattle from menacing public traffic. In 1939, on 12,000 acres of barley, the average production was 46 to 48 bushels per acre as against the State average of 42 to 46. On other special areas of the big rancho, the grain production was thirty sacks per acre as against a State average of ten.

Altho 1,000 acres was sold to the Haven Seed Company in 1925, there was no major breakup of the Santa Margarita Ranch lands till late 1938, when 4,600 acres was sold to the Bixby cattle interests for \$92,000. However, war and national needs in 1942 brought about what all the pressure of organized realtors was unable to do when 140,000 acres of the vast rancho was sold to the United States Government for two and one-quarter million dollars.

Just as the lands had been adapted for husbandry's peaceful pursuits, they were more than ordinarily fitted for war needs and the Santa Margarita Rancho now became Camp Pendleton, one of the largest Marine Corps training bases in the United States. Even in adapting its well fitted, varied terrain to the training of Uncle Sam's warriors, the former productive existence of the big rancho was by no means ended. In 1943, livestock and field crops were still being produced on areas which would not interfere with military operations, the agricultural tenants paying the Federal government an annual rental of over two hundred thousand dollars, approximately nine percent on the Government's investment.

In addition to its military value in wartime and the retained producing capacity of farm and range lands, the Santa Margarita Rancho represents a rural historical link between the past and present. Amid modern improvements, all the pre-American atmosphere has been retained. The main ranch house, part of which was built about 1830, is typical of the construction of that period and the village surrounding it is reminiscent of old Spanish days, even to the small private ranch chapel. The Marine Corps officers, while making the buildings serve their military purposes, are preserving this picturesque rancho headquarters as a veritable museum of early-day California history.



## Changed conditions and More People

As figures previously quoted prove, at the beginning of the 1940-50 decade, rural California had pretty well pulled itself out of the depression slump and with a considerable less Federal financing than most of the other agricultural states. There was still a lot of adjustment to be made. Urban wages, dictated by trade unions, soared to new heights. We find the Pacific Rural Press, leading California agricultural journal, setting forth on March 8, 1941: - "If farmers were paid the same as the building trades are paid, beef would sell for \$3 a pound, eggs would be \$2 a dozen and bread would sell for 25 cents a loaf."

Labor unions had invaded the rural districts in real earnest and the small independent farmer who must hire labor to help harvest his crops suffered relatively more than the big land-owners. As a class, farmers did not share the optimism and contentment expressed by a two hundred-year old English "Toast" quoted by a 1941 contemporary writer which asserted:

Let the wealthy and great roll in splendor and state,  
I envy them not, I declare it,  
I eat my own lamb, my chicken and ham,  
I shear my own fleece and wear it.  
I have lawns, I have bowers, I have fruits, I have flowers,  
The lark is my morning alarmer; -  
So jolly boys now, "Here's Godspeed the Plow,  
Long life and success to the farmer."

While Hitler's Juggernaut rolled over Europe, while Jap diplomats assured national leaders of their peaceful intention and Japanese warlords made last preparations for their plan, the California farmer had little time to relax in the "leafy bowers" of the poet's dream.

National defense needs in 1940 and 1941 were calling men from the farm, mine and forest to serve as citizen soldiers and industrial war material plants were offering attractive wages to also draw men from the soil. Coming events had somewhat cast their shadows before as metal junk cluttering up the farmer's back lot had been picked up by roving trucks at unheard of prices, ultimately to feed Japan's budding war machine, and up and down the sea coast giant hose lines fed California's prodigally-produced oil into tankers carrying the flag of the rising sun.

The Federal census of 1940 accounted for less than 100,000 Japanese in the State, a rather small percentage of the total



However, their dominant position in California agriculture and commercial fishing could hardly be denied, a dominance which was soon to cease. A large part of the rich returns they wrested from the land which harbored them went back to their homeland to help forge the weapons soon to be turned against the breasts of their benefactors. The late Eugene S. Kellogg, Agricultural Commissioner of Santa Barbara county, said of the Jap farmers of that section in 1941, "They buy here their seed, fertilizer and bare living needs - the rest of the money they make goes overseas. In the face of national feeling on the matter, it seems there is just nothing we can do about it."

The California Taxpayers' Association estimated that by the end of 1941 California's population had reached a figure of 7,350,000, an increase of almost six and one-half percent since the official 1940 census was taken. The last official count gave California a population density of 44.1 per square mile, a figure almost exactly that of the national average. As a basis of comparison, and using the same official figures, New York State had 280 people per square mile; Indiana, 95; Pennsylvania, 220; Ohio, 168, and Georgia, 53. Agricultural Belgium had 700 persons per square mile, Germany 400, Italy 370, and France 200.

L. C. Gray, Assistant Chief of the Bureau of Agricultural Economics, reporting on national population increases that year, summarized: "Even if we continue agriculturally self sustained, a density of 50 (people) per square mile will not represent a serious pressure on our agricultural land resources, provided we employ sound policies of land utilization and land tenure." Although residents of California had more than average elbow room, a study of the Federal census figures disclosed that 47 million of the entire nation's 130 million people lived on less than three-tenths of one percent of the nation's total land area, attesting to the modern trend of urban existence.

With the location of many of the war plants in the kindly climate of California, 1940 and 1941 witnessed an influx of people quite comparable to that of the Dust Bown migration of a few years previously. To many persons here was a chance to go to a much-talked-of California and be assured of a job on arrival. The jobs were generally waiting, all right, either in war plants or on the now undermanned farms. The housing of this new migrant tide, however, added to a still unsettled transient population, was a problem which could not be met over night. While the pressure was mainly urban, the population stimulous materially effected surrounding rural areas as well. The county health officer of Monterey county, in speaking of conditions there, said, "No woman has had her baby in the street yet, but a good many births take place under undesirable conditions."





California boosters in 1940 were glibly talking in terms of a 20-million population figure and even official State bodies studying population trends and land use stated that California population "can and might be" 13,070,000 in 1950 and 19,140,000 in 1960, basing their figures on the natural increase and emigration of previous decades. Some of the more optimistically-minded boosters, using these past trends as a gauge, predicted a State population of 26,300,000 by 1970.

A few of the more conservative economists pointed out that while successful war plants might leave in their wake peacetime industrial ventures and resultant increased urban populations, such industrial expansion would be at the expense of rural land use and development. Water for the land and industrial needs, they warned, must be the controlling factor in population growth and within the limits of available supply, water for industry and urban use would have to be taken away from the rural lands.

In the dark December days of 1941, when the Japanese struck at the nation whose resources had trustingly aided them in bringing their war machine to active life, California land users tightened their belts for the struggle. This was a struggle in which they must play a major part, to insure the Four Freedoms set up by the Nation's chief as a standard for the American way of living, - Freedom from Want; Freedom from Fear; Freedom of Speech, and Freedom of Worship. A more intensive form of Democracy was being nurtured in California, as elsewhere in the Great Republic.





